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axis, dry, opening in 2 valves along the outer edge. Seeds with a crustaceous testa and a small membranous arillus or strophiole. Embryo curved round a central albumen.—Erect herb. Leaves linear. Flowers small, all axillary and nearly sessile, with 2 bracteoles under the perianth.

The single species is endemic in Australia. The male individuals would be generically undistinguishable from *Gyrostemon*, but for the more deeply lobed calyx, which in the females is accompanied by the reduction of the carpels to two, the herbaceous habit giving the plant moreover a sufficiently distinct facies to justify its retention as a separate genus.

1. **D. thesioides,** *Hook. f. in Hook. Lond. Journ.* vi. 279, *and Fl. Tasm.* i. 309, t. 93. Stems erect, often hard at the base with rather slender virgate branches, from under 1 ft. to nearly 2 ft. high, glabrous and smooth or slightly scabrous with minute papillæ. Leaves linear, the lower ones sometimes rather broad and flat, 1 to 2 in. long, and narrowed into a short petiole, the upper ones narrower smaller and sessile, and sometimes nearly all very narrow and almost terete or filiform, the floral ones often not $\frac{1}{2}$ in. long. Flowers very small and almost sessile in the upper axils, all turned to one side and slightly nodding, with a pair of minute bracteoles under the perianth. Perianth not $\frac{1}{2}$ line long, unequally divided nearly to the base into 4 segments varying much in breadth. Anthers nearly 1 line long. Fruit $1\frac{1}{2}$ to 2 lines broad, the central axis not 1 line long, emarginate between the carpels, the styles often persistent in the notch and arched over the carpels.—Moq. in DC. Prod. xiii. ii. 37; *D. Drummondii*, Moq. l.c.; *D. veroniciformis*, F. Muell. in Linnæa, xxv. 438.

Tasmania. Near Launceston, *Lawrence;* Flinders island, *Gunn, Milligan.*
S. Australia. Port Lincoln, Dombey Bay, *Wilhelmi.*
W. Australia, *Drummond, n.* 216, *Preiss, n.* 1226 (referred in Pl. Preiss. ii. 397 doubtfully to *Euphorbiaceæ*); King George's Sound, *F. Mueller.*

3. GYROSTEMON, Desf.

(Cyclotheca, *Moq.*)

Flowers diœcious. Perianth very open under the fruit, very shortly and obtusely or obscurely sinuate-toothed. Stamens in the males either 8 to 12 radiating in a single series round a central disk or numerous covering the whole disk, the anthers oblong, nearly sessile. Ovary in the females of 4 to 20 carpels, more or less connate in a ring round a central column slightly or scarcely dilated at the top. Styles or stigmas from ovate to linear, free or slightly connected in a ring round the summit of the central column, persistent or more frequently deciduous. Fruiting carpels separating from each other and from the axis, opening usually in 2 valves both along the outer and the inner edge.—Shrubs (except *G. brachystigma?*). Leaves linear. Flowers axillary, sessile or on short recurved pedicels, with 2 bracteoles usually very small under the perianth.

The genus is limited to Australia.

Flowers sessile. Ovary of 4 to 10 carpels. Styles short ovate. Fruit small, much depressed. Leaves few, distant	1. *G. brachystigma.*
Flowers sessile. Ovary of 8 to 15 carpels. Styles linear. Fruit nearly globular. Stamens 8 to 12 in a single ring	2. *G. cyclotheca.*
Flowers shortly pedicellate. Ovary of 15 to above 20 carpels. Styles shortly linear. Fruit obovoid or pear-shaped. Stamens 30 to 50 covering the whole disk	3. *G. ramulosus.*

1. **G. brachystigma,** *F. Muell.* Lower part of the stem not seen, but probably shrubby, the branches elongated, almost rush-like, with few distant linear-terete rather thick leaves, mostly small, the lower ones sometimes 1 in. long. Male flowers not seen. Females sessile in the axils, very small, the open perianth scarcely 1 line diameter. Ovary of 4 to 10, usually about 6 carpels, the angles prominent. Stigmas ovate, flat, round a somewhat dilated central disk or summit of the column. Fruits broadly turbinate or almost hemispherical, under 2 lines diameter, much depressed in the centre, the angles prominent before the dehiscence.—*Amperea? subnuda*, Nees in Pl. Preiss. ii. 229.

W. Australia, *Drummond;* York district, *Preiss, n.* 1233.

2. **G. cyclotheca,** *Benth.* A much branched shrub, sometimes low and straggling sometimes erect and attaining 4 or 5 ft. Leaves narrow-linear and flat, or linear-terete slender and almost filiform, acute or with hooked points, from $\frac{1}{2}$ to 1 in. long. Flowers small, on very short axillary recurved pedicels or quite sessile, the open perianth about $1\frac{1}{2}$ lines diameter. Stamens in the males about 8 to 12, in a single ring round the flat central disk. Carpels in the females 8 to 12 or rarely more; styles or stigmas linear, rather long, in a ring round the small scarcely dilated summit of the column. Fruit nearly globular, scarcely or not at all depressed in the centre, about 3 lines diameter but rather variable in size, the dorsal angles of the carpels very prominent, separating at maturity and opening both at the inner and outer edge as in *G. ramulosus.*—*Cyclotheca Australasica*, Moq. in DC. Prod. xiii. ii. 38; *Gyrostemon ramulosus*, Schlecht. in Linnæa xx. 632, not of Desf.; *Didymotheca pleiococca*, F. Muell. Pl. Vict. i. 198, t. suppl. 9.

N. Australia? Sturt's Creek near Mount Mueller, *F. Mueller;* between Bonney river and Mount Morphett, *M'Douall Stuart's Expedition* (in both cases only male specimens and the identification uncertain).

Victoria. In the Mallee Scrub, from the Wimmera through the north-western part of the colony, growing especially on sandhills, *F. Mueller.*

S. Australia. Encounter Bay, *Whittaker;* Murray river to St. Vincent's and Spencer's Gulfs, *Behr., F. Mueller* and others; Kangaroo island, *Waterhouse.*

W. Australia. Swan river, *Drummond, 1st coll.;* Swan and Murchison rivers, *Oldfield.*

Notwithstanding the difference in the stamens which is so often of no more than specific value in diœcious plants, this appears to me to be much nearer to *Gyrostemon ramulosus* than to *Didymotheca.* The size and and in some respects the shape of the fruit as well as the number of carpels are often so similar that there are some fruiting specimens which can scarcely be distinguished from those of *G. ramulosus* but by the shortness of the pedicels.

3. **G. ramulosus,** *Desf. in Mem. Mus.* vi. 17, t. 6. An erect bushy much branched shrub of 3 to 8 ft., often of a somewhat fleshy habit. Leaves linear-terete, thick or slender, 1 to 3 in. long. Flowers small, on axillary reflexed pedicels of 2 to 4 lines. Calyx varying from 1 to 2 lines diameter when open. Stamens in the males from 30 to 50, crowded in several series covering the whole centre of the flower. Ovary in the females small, nearly hemispherical, the carpels varying from about 15 to above 20, the styles linear and rather long when perfect. Fruit obovoid turbinate or more or less pear-shaped, slightly depressed on the top, with a small central disk or summit of the column, round which the styles sometimes persist to the maturity of the fruit, but often wear off early, the dorsal angles of the carpels prominent from an early stage, the carpels at maturity separating and opening more or less at the inner as well as at the dorsal angle.—Moq. in DC. Prod. xiii. ii. 38.

N. Australia. Bay of Rest, N. W. coast, *A. Cunningham;* Fincke river, *M'Douall Stuart's Expedition.*

W. Australia. King George's Sound, *Maxwell* (a single specimen in Herb. F. Muller); near Stirling Range, *F. Mueller*; Swan river, *Drummond*, *1st coll.;* Point Henry and Murchison river, *Oldfield;* Sharks Bay and Dirk Hartog's island, *Milne* (originally described by Desfontaines from Sharks Bay specimens).

I have presumed that all the male specimens with the anthers covering the centre of the flower belong to this species, but they vary considerably, and some lead me into doubt whether there may not be another species with the male flowers of *G. ramulosus* and the females of *G. cyclotheca;* the foliage shows no constant difference and the pedicel of the flower, both male and female, is somewhat variable in length.

4. CODONOCARPUS, A. Cunn.

(Hymenotheca, *F. Muell.*)

Flowers diœcious or monœcious. Perianth very open under the fruit, very shortly and obtusely or obscurely sinuate-toothed. Stamens in the males 10 to 20 radiating in a single series round a central disk, the anthers oblong, nearly sessile. Ovary in the females of 20 to 50 carpels connate in a ring round a central column dilated into a flat disk at the top. Styles or stigmas short or linear, free or slightly connected in a ring round the terminal disk. Fruiting carpels closely connected till near their maturity, separating when ripe from each other and from the central column and opening only along their inner edge. Seeds of adjoining carpels alternately placed near the top and below the top of the carpel, each with a small membranous aril or strophiole.—Tall shrubs or trees. Leaves linear or broad. Flowers in leafless racemes, axillary or terminal or the females on the leafless bases of the year's shoot. Bracteoles usually very small under the perianth.

The genus is limited to Australia.

Leaves narrow linear. Styles rather long. Carpels 30 to 40 . . 1. *C. pyramidalis.*
Leaves lanceolate, tapering into a long point. Carpels 40 to 50 . 2. *C. australis.*
Leaves obovate to broadly lanceolate, obtuse or shortly pointed.
Styles short, conical. Carpels about 20 to 30 . . . . 3. *C. cotinifolius.*

1. **C. pyramidalis,** *F. Muell.* A tall arborescent shrub of pyramidal growth. Leaves narrow-linear, acute, contracted into a short petiole or almost sessile, 2 to 3 in. long. Flowers diœcious, in lateral or axillary racemes, the males on very short pedicels, the females on rather long ones. Perianth about 1½ lines diameter. Ovary almost hemispherical, nearly 3 lines diameter, the central disk or dilated summit of the short column depressed; carpels from 30 to 40; styles or stigmas linear, rather long and recurved over the margins of the carpels. Fruit somewhat pear-shaped, 7 to 8 lines long, 6 to 7 lines diameter at the top and rounded and not so much expanded as in *C. australis.*—*Gyrostemon pyramidalis*, F. Muell. in Linnaea, xxv. 458; *Hymenotheca pyramidalis*, F. Muell. Fragm. i. 202.

S. Australia. Elder's Range, *F. Mueller;* in the interior, *M'Douall Stuart.*

2. **C. australis,** *A. Cunn. Herb.; Moq. in DC. Prod.* xiii. ii. 39. A tree of 20 ft. with numerous slender flexuose branches. Leaves lanceolate, tapering into a long narrow point and contracted into a long petiole, 1½ to 3 in. long. Flowers not seen. Fruits on long pedicels along the leafless bases of axillary branches (racemes of which the axis has grown out into a leafy branch ?). Perianth 2 to 2½ lines diameter. Fruit turbinate, almost campanulate, 7 to 8 lines long, very broad at the apex, and rather deeply depressed in the centre, the disk or dilated summit of the central column 3 to 4 lines diameter; carpels 40 to 50, quite connate when young, their dorsal edges forming prominent ribs when approaching maturity, and finally separating completely, the sides then thin and transparent, empty and indehiscent in the lower part, broader and opening at the inner edge in the upper seed-bearing portion, but in alternate carpels close to the top or a little above the middle.—*Gyrostemon attenuatus,* Hook. Bot. Misc. i. 244, t. 53.

Queensland. Brisbane river, Moreton Bay, *A. Cunningham, Fraser.*
N. S. Wales. Richmond river, *Fawcett.*

It must have been owing to some mistake that the carpels have been described as having 3 or 4 ovules in each, of which only one comes to maturity. I can find no trace of any more than one in the youngest fruits on the specimens. The second seed figured in the *Botanical Miscellany* evidently belongs to the adjoining carpel. Two carpels sometimes remain unseparated and the valves are so thin that without careful examination the two seeds appear to be in one carpel, one a little above and overlaying the other as represented by the artist.

3. **C. cotinifolius,** *F. Muell. Pl. Vict.* i. 200. Usually a tall shrub or small tree, but attaining sometimes 40 ft., of a pale or glaucous green. Leaves from broadly obovate or ovate to elliptical-oblong or almost lanceolate, obtuse or shortly pointed, contracted into a rather long petiole, 1 to 2 in. long. Flowers diœcious or monœcious but usually the two sexes in separate racemes in the upper axils, sometimes forming a terminal panicle, the males on very short, the females on rather long pedicels. Perianth about 2 lines diameter in the females, rather smaller in the males. Stamens 15 to 20. Ovary about twice as long as the calyx, broadly turbinate, depressed in the centre, consisting of

20 to 30 or rather more carpels, the ovaries in alternate carpels inserted near the top or about the middle of the cavity so as to give the appearance of biseriate cells or carpels. Styles or stigmas shortly conical and soon wearing off or falling off in a ring. Fruit obconical or obovoid, much less expanded at the top and much less depressed in the centre than in *C. australis*, about 5 lines diameter, the carpels less distinctly biseriate than when young, separating and dehiscent on the inner edge as in *C. australis*.—*Gyrostemon cotinifolius*, Desf. in Mem. Mus. viii. 116, t. 10; Moq. in DC. Prod. xiii. ii. 39; *G. pungens*, Lindl. in Mitch. Three Exped. ii. 121; *G. acaciæformis*, F. Muell. in Linnæa, xxv. 439.

N. Australia. In the interior lat. 20°, *M'Douall Stuart's Expedition.*

N. S. Wales. Lachlan, Darling, and Murray rivers, *Mitchell, Victorian and other Expeditions;* Mount Murchison, *Bonney.*

Victoria. Mallee scrub on the Murray, *Hughan;* Wimmera, *Dallachy.*

S. Australia. Flinders range, *F. Mueller;* Cooper's river, *A. C. Gregory.*

W. Australia, *Drummond*, n. 40; Murchison river, *Oldfield;* Sharks Bay *Milne.*

5. TERSONIA, Moq.

Flowers diœcious. Perianth very open under the fruit, very shortly and obtusely or obscurely sinuate-toothed. Stamens in the males 8 to 12 or rather more, radiating in a single series round a central disk; anthers oblong, nearly sessile. Ovary of the females (in *T. brevipes*) of 15 to 20 carpels completely connate into a plurilocular fleshy ovary not ribbed but marked with horizontal raised concentric zones. Styles or stigmas linear, radiating round a broad central disk or dilated summit of the central column. Fruit (where known) depressed globular, indehiscent, almost woody. Seeds oblong, all on the same level, with a small membranous aril or strophiole. Embryo folded. Albumen scanty or none.—Diffuse shrubs or herbs. Leaves linear. Flowers sessile or nearly so, the males in terminal racemes or interrupted spikes, the females (where known) solitary in the axils of the stem-leaves. Bracteoles under the perianth small.

The genus is endemic in W. Australia.

Leaves long, narrow linear . . . . 1. *T. brevipes.*
Leaves short, distant. Branches flexuose or twining . . . . . . 2. *T. subvolubilis.*

1. **T. brevipes,** *Moq. in DC. Prod.* xiii. ii. 40 (*as to the female plant*). A decumbent shrub of 2 or 3 ft. with ascending flowering branches. Leaves linear or linear-terete, rather thick, 1 to 2 in. long or even more. Male flowers all in terminal leafless spikes or racemes, the floral leaves all reduced to small bracts or the lower ones rarely exceeding the flowers. Anthers radiating to a diameter of nearly 3 lines when fully out. Female flowers all sessile and solitary in the axils of distant stem-leaves. Perianth scarcely 1½ lines diameter. Styles or stigmas nearly 2 lines long, the central disk bordered within them by a raised undulate margin. Fruit 6 to 8 lines diameter, armed with raised almost scale-like hard tubercles more or less arranged in

irregular horizontal zones. Seeds small, oblong.—*Gyrostemon ramulosus*, Lehm. Pl. Preiss. i. 243, not of Desf.; *G. angustifolius*, Schnitzl. Ic. Fam. Nat. t. 208.*

W. Australia. Swan river, *Preiss. n.* 1234; Swan and Murchison rivers, *Oldfield.*

The male specimens described by Moquin belong to *Gyrostemon ramulosus*, Desf.

2. **T.? subvolubilis,** *Benth.* Stems numerous, herbaceous diffuse and flexuose, many of them apparently twining, attaining 1 ft. and more, the flowering branches ascending, slightly scabrous, perhaps viscid when fresh. Leaves small, linear or linear-lanceolate, acute, contracted at the base, rarely exceeding ½ in. and usually few and distant. Male flowers in terminal interrupted spikes, precisely like those of *T. brevipes*; females unknown.

W. Australia. Oldfield river and Phillips Ranges, rare, *Maxwell.*

The female flowers and fruits of this species being as yet unknown, the genus must be in some measure uncertain, but the inflorescence of the males and their general habit agree with none but *Tersonia.*

ORDER XCVI. CHENOPODIACEÆ.

(Salsolaceæ, *Moq. in DC. Prod.* xiii. ii.)

Perianth small, with 5 or fewer segments or lobes, herbaceous or rarely thin and transparent or somewhat scarious, imbricate in the bud. Stamens 5 or rarely fewer, opposite the perianth-segments and usually inserted at or near their base; anthers 2-celled, the cells opening longitudinally. Ovary free, 1-celled, with a single ovule erect or suspended from an erect funicle. Styles or style-branches 2 or 3, stigmatic along their whole inner edge or rarely towards the end only. Fruit 1-celled and indehiscent, membranous or succulent, enclosed in or resting on the persistent perianth which is sometimes enlarged or altered in form. Seed solitary, erect or horizontal, usually orbicular and flattened. Embryo coiled round a mealy albumen, or spirally twisted without any or with scarcely any albumen.—Herbs or undershrubs, often succulent and very frequently hoary or white, especially the young parts, with a minute and mealy or more dense and scaly tomentum, or in some genera villous or woolly. Leaves alternate or very rarely opposite, sometimes none. Stipules none. Flowers small, usually sessile and clustered, either axillary or in axillary or terminal dense or interrupted spikes or panicles, and often unisexual. Bracts inconspicuous, or, in some genera, 1 bract and 2 bracteoles more or less conspicuous.

A considerable Order, spread over the greater part of the world, but most abundant in maritime or saline situations in the Old World, a few species, in identical or closely allied forms, being quite cosmopolitan. Of the fifteen Australian genera seven have the general distribution of the Order, the remaining eight appear to be endemic.

TRIBE 1. **Chenopodieæ.** – *Branches continuous. Leaves flat, glabrous, mealy, scaly or glandular. Testa crustaceous. Embryo curved round a mealy albumen.*

Perianths equally 5- or 4-lobed, herbaceous, not much enlarged in fruit.
Fruit a small succulent berry . . . . 1. RHAGODIA.

Fruit a dry nut enclosed in the perianth . . . . 2. CHENOPODIUM.
Perianths minute white and dry, with 3 or 1 clavate segments . . 3. DYSPHANIA.
Male perianths small, equally 5- or 4-lobed, females much enlarged in fruit with 2 broad appressed segments enclosing the fruit . . 4. ATRIPLEX.

TRIBE 2. **Camphorosmeæ.**—*Branches continuous. Leaves narrow, entire, flat or terete, glabrous, villous tomentose or woolly. Testa membranous. Embryo curved round a mealy albumen.*

Fruiting-perianths globular or depressed, membranous, herbaceous or succulent, the lobes horizontally (or rarely conically) closing over the fruit. Seed horizontal or oblique.
  Fruiting-perianth without appendages, succulent or coriaceous, glabrous or the lobes slightly pubescent . . . . 5. ENCHYLÆNA.
  Fruiting-perianth surrounded by 3 to 5 distinct or by 1 continuous annular horizontal wings . . . . 6. KOCHIA.
  Fruiting-perianth membranous or herbaceous, enveloped in wool or long hairs, without any or with horn-like or spinescent dorsal appendages . . . . 7. CHENOLEA.
Fruiting perianth hard, at least at the base, the lobes usually membranous and withering.
  Fruiting-perianth with dorsal wings.
    Flowers solitary. Wings 2 or 3, nearly vertical. Seed horizontal . . . . 8. BABBAGIA.
    Flowers 2 together divaricate and connate at the base. Wings 5, horizontal. Seed vertical . . . . 9. DIDYMANTHUS.
  Fruiting-perianth without any or with spinescent dorsal appendages.
    Fruiting-perianth tomentose or woolly, with 2 opposite diverging dorsal spines rarely wanting. Seed horizontal or oblique . . . . 10. SCLEROLÆNA.
    Fruiting-perianth glabrous, without appendages or rarely with 5 small erect spines. Seed horizontal or oblique . . . . 11. THRELKELDIA.
    Fruiting-perianth glabrous or slightly hairy, with 3 to 5 divaricate dorsal spines. Seed vertical . . . . 12. ANISACANTHA.

TRIBE 3. **Salicornieæ.**—*Branches articulate, fleshy. Leaves none. Flowers more or less immersed. Testa various. Embryo curved or folded with little or no albumen.*

Single genus . . . . 13. SALICORNIA.

TRIBE 4. **Salsoleæ.**—*Branches continuous. Leaves narrow, flat or terete, entire. Testa various. Embryo spirally coiled, without albumen.*

Perianth small, herbaceous, without appendages. Testa crustaceous.
  Embryo coiled in a flat spire . . . . 14. SUÆDA.
Perianth rigid, with dorsal horizontal wings. Testa membranous.
  Embryo coiled in a conical or biconvex spire. (Leaves and bracts pungent) . . . . 15. SALSOLA.

TRIBE 1. CHENOPODIEÆ.—Branches continuous (not articulate). Leaves flat, often triangular or hastate, glabrous mealy scaly or glandular. Testa of the seed crustaceous. Embryo curved round a mealy albumen.

1. RHAGODIA, R. Br.

Flowers polygamous, mostly hermaphrodite or female, but sometimes almost diœcious. Perianth deeply 5-cleft, the lobes or segments obtuse, concave, scarcely enlarged in fruit, and either closing over the fruit or expanded under it. Stamens 5 or fewer, filaments more or less flattened. Ovary globular or nearly so. Styles 2 or very rarely 3, shortly subulate, very shortly united at the base. Fruit a small depressed-globular berry. Seed flattened, horizontal; testa crustaceous. Embryo circular, enclosing a mealy albumen.—Shrubs undershrubs or rarely herbs. Leaves alternate or some or nearly all opposite, flat, entire. Flowers small, sessile or very rarely pedicellate, in clusters or rarely solitary, in interrupted terminal spikes or panicles, without bracts. Perianth tomentose outside, glabrous inside.

The genus is exclusively Australian, differing from *Chenopodium* in the succulent pericarp and usually in the more shrubby habit. The species are often very variable in stature and foliage and very difficult to mark out by positive characters. They are moreover often represented in herbaria by specimens so imperfect as to leave a large proportion of the determinations doubtful. The succulent pericarps or berries appear to vary in colour, even in the same species, from red or purple to yellow, but perhaps the collectors' notes in this respect are not all to be trusted

- Panicle usually much branched.
  - Flowers polygamous.
    - Leaves almost all alternate, mostly narrow and green above, paler or whiter underneath than above, the margins often recurved . . . . 1. *R. Billardieri.*
    - Leaves alternate or opposite, mostly broad, flat, green or white on both sides . . . . 2. *R. parabolica.*
  - Flowers diœcious, very small. Leaves oblong or broad, flat, pale or white on both sides . . . . 3. *R. dioica.*
- Inflorescence nearly single or panicle not much branched.
  - Leaves rather thick and fleshy, flat or concave, mostly alternate. Plant not spinescent.
    - Fruiting perianth 2 to 3 lines diameter when open and much larger than the fruit. Leaves mostly hastate 4. *R. Gaudichaudiana.*
    - Fruiting perianth 1 to 1½ lines diameter and usually not broader than the fruit.
      - Leaves rarely above ¼ in. long, linear cuneate or rarely obovate . . . . 5. *R. crassifolia.*
      - Leaves linear, ½ to 1 in. long . . . . 6. *R. Preissii.*
      - Leaves broadly obovate to oblong, ½ to 1 in. long . . 7. *R. obovata.*
  - Leaves flat, rather thin, mostly alternate broad and small. Plant spinescent . . . . 8. *R. spinescens.*
  - Leaves thin, green, opposite or alternate. Plant usually slender or weak.
    - Leaves mostly opposite, ovate or hastate, very obtuse . . 9. *R. hastata.*
    - Leaves mostly opposite, lanceolate or broad, all acute . . 10. *R. nutans.*
    - Leaves alternate, linear . . . . 11. *R. linifolia.*

R. chenopodioides, Moq. Chenopod. Enum. 11, and in DC. Prod. xiii. ii. 52, from Port Jackson, *Gaudichaud* is unknown to me, the character given agrees with that of *R. Billardieri*, except that the flowers are said to be pedicellate, which may have been an accidental anomaly in the specimens described.

1. **R. Billardieri,** *R. Br. Prod.* 408. A shrub either straggling or diffuse, or erect and attaining 5 or 6 ft., the foliage and young shoots somewhat fleshy, rarely quite green, but usually with less of the mealy tomentum than most species, except on the inflorescence. Leaves alternate or rarely here and there opposite or nearly so, usually oblong-lanceolate or linear-oblong, but varying to quite linear or when small

to ovate or broadly hastate, always obtuse, contracted into a short petiole, from scarcely ½ in. to above 1 in. long, usually green above when full grown and pale or whitish underneath, the margins often recurved and never incurved. Panicle terminal, usually much branched and 1½ to above 2 in. long, the branches rather slender and divaricate, the flowers small, polygamous, in distinct clusters. Perianth about 1 line diameter, or when fully expanded under the fruit attaining 1½ lines, lobed to about the middle. Berry when fully ripe as broad as or broader than the expanded perianth.—*Chenopodium baccatum*, Labill. Pl. Nov. Holl. i. 71, t. 96; *Rhagodia baccata*, Moq. in DC. Prod. xiii. ii. 50; Hook. f. Fl. Tasm. i. 312; *R. Candolleana*, Moq. Chenop. Enum. 10 (with small broad leaves approaching the var. *congesta*).

N. S. Wales. Port Jackson, *R. Brown*, *Woolls*; Macleay river and Ash island, *Beckler* (the latter specimens not good and rather doubtful); Twofold Bay, *A. Cunningham* and others.

Victoria. Abundant along the sea-coast from the Glenelg to the eastern frontier, *F. Mueller* and others.

Tasmania. Port Dalrymple, *R. Brown*; common in salt marshes especially on the north coast, *J. D. Hooker*, *Labillardière* and others.

S. Australia. Lower Murray river and round St. Vincent's Gulf, *F. Mueller* and others.

W. Australia. Goose island and Lucky Bays, *R. Brown*; common along the sea-coast from King George's Sound round to Swan and Murchison rivers, *Fraser*, *Drummond*, n. 269, *Oldfield* and others, and eastward to the Great Bight, *Maxwell*.

Among the numerous forms which this species assumes, many of them no doubt owing to local influences, the following are the most distinct in the dry state:—

Var. *congesta*, Hook. f. Fl. Tasm. i. 312. Low and much branched, densely crowded with leaves and inflorescences; leaves mostly ovate small and here and there hastate.—*Chenopodium congestum*, Hook. f. in Hook. Lond. Journ. vii. 280; *Rhagodia congesta*, Moq. in DC. Prod. xiii. ii. 51.—Tasmania and Victoria.

Var. *linearis*. Leaves all narrow-linear.—*R. radiata*, Nees in Pl. Preiss. i. 637, Moq. in DC. Prod. xiii. ii. 50.—Chiefly in W. Australia where it passes very gradually into the oblong or linear-oblong leaved form there very abundant, and readily distinguished from the linear-leaved form of *R. crassifolia* by the recurved or revolute margins of the leaves and the more branched panicle.

2. **R. parabolica,** *R. Br. Prod.* 408. An erect shrub, attaining sometimes 8 or 10 ft., but often much lower, mealy-white all over or in the more slender specimens the adult leaves green. Leaves opposite or alternate, on rather long petioles, broadly ovate obovate or almost rhomboidal, usually rounded at the end and obtuse or shortly mucronate, contracted or rarely obtusely hastate at the base, rarely exceeding 1 in. and often under ½ in. long. Flowers, as in *R. Billardieri*, polygamous, in distinct clusters along the divaricate branches of a terminal panicle, sometimes very dense and crowded, sometimes loose and slender. Perianth mealy-tomentose and sometimes densely so, the lobes ovate, obtuse, more united at the base than in most species, expanding to above 1 line diameter, but the succulent ripe fruit still larger. Seed about 1 line diameter.—Schlecht. in Linnaea, xx. 574; Moq. in DC. Prod. xiii. ii. 51; *R. reclinata*, A. Cunn. Herb.; Moq. l. c. 51 (with the leaves less white than in the typical form).

Queensland. In the interior, *Mitchell, Bowman;* Armadilla, *Barton;* Curriwillighie, *Dalton;* between Burnett and Dawson rivers, *F. Mueller.*

N. S. Wales, *Leichhardt;* Liverpool plains, *A. Cunningham;* Richmond river, *Henderson.*

S. Australia. Spencer's Gulf, *R. Brown;* Murray Scrub, *Behr.;* Murray river and Salt Creek, *F. Mueller.*

This may possibly prove to be an inland variety of *R. Billardieri.*

3. **R. dioica,** *Nees in Pl. Preiss.* i. 636. A tall shrub, with the habit of *R. parabolica*, usually hoary or white. Leaves alternate or nearly opposite, on rather long petioles, oblong obovate ovate or rarely broadly hastate, very obtuse, flat, rather thin, pale or hoary on both sides, often above 1 in. long. Flowers smaller than in either of the preceding species, diœcious in all the specimens seen, very numerous in a dense much branched ovate or pyramidal panicle of two or three inches. Fruiting perianth small, the fruit rather larger, but not exceeding 1 line diameter.—Moq. in DC. Prod. xii. ii. 50.

W. Australia, *Drummond;* Swan river, *Preiss, n.* 1253, Murchison river, *Oldfield.*

4. **R. Gaudichaudiana,** *Moq. Chenop. Enum.* 11, *and in DC. Prod.* xiii. ii. 53. A very divaricate or prostrate shrub, covered with a dense soft white tomentum which usually persists even on the old leaves, the branchlets sometimes but very rarely almost spinescent. Leaves mostly alternate, from broadly orbicular or deltoid to lanceolate, often hastate at the base, rather thick, flat or concave, ½ to 1 in. long. Flowers polygamous (or sometimes diœcious?) larger than in the allied species, solitary or clustered in nearly simple interrupted spikes or along the divaricate branches of short terminal panicles. Fruiting perianth 2 to 3 lines diameter, lobed to the middle, very cottony outside, glabrous and coloured or green inside, much larger than the fruit and either closed over it or expanded under it.

N. S. Wales. Darling river, *Victorian Expedition.*

S. Australia. Gawler Range, *Sullivan.*

W. Australia. Murchison river, *Oldfield;* Sharks Bay, *Gaudichaud* (I have not seen the latter specimens).

The specimens from N. S. Wales and from S. Australia have the perianth not quite so large as those from Murchison river, but they are not so far advanced. There are many other specimens in Herb. F. Mueller from the desert interior of N. S. Wales and S. Australia, mostly mere scraps barely in flower, which may belong to *R. Gaudichaudiana*, but which cannot be safely distinguished from some of the following species.

5. **R. crassifolia,** *R. Br. Prod.* 408. A dwarf or diffuse much branched scrubby shrub, or the branches somewhat elongated in narrow-leaved forms, nearly green or more or less hoary-tomentose. Leaves mostly alternate, linear or scarcely oblong in the typical form, rarely cuneate or almost obovate in some varieties, obtuse, contracted into a short petiole, rather thick, flat or concave, rarely ½ in. long. Flowers and fruits small, clustered or rarely solitary, in short terminal nearly simple interrupted spikes or slightly branched panicles. Fruiting perianth not exceeding the fruit.

N. Australia. Sturt's Creek, *F. Mueller.*

Victoria. Wimmera, *Dallachy.*

S. Australia. Kangaroo island, *R. Brown*; towards Spencer's Gulf, *Warburton*.

W. Australia. Scattered over the treeless plains N. W. of the Great Bight, *Delisser*; Point Henry and Murchison river, *Oldfield*.

Var. *latifolia*. Leaves obovate ovate hastate or broadly oblong, all very obtuse and under ½ in. long.—*R. crassifolia*, Moq. in DC. Prod. xiii. ii. 52. Dirk Hartog's island, *A. Cunningham*.

There are several imperfect specimens from the desert interior, in Herb. F. Mueller and others, which may belong to this species but cannot be determined with any certainty. *R. Drummondii*, Moq. in DC. Prod. xiii. ii. 52, from W. Australia, *Drummond*, *n.* 133, seems to be a half-starved small and narrow-leaved state of this species. The flowers are said to be diœcious, our specimens are not sufficient to ascertain whether they are really so. I have not seen *Drummond's n* 715, described by Moq. l.c. as *R. parvifolia*, but the character entirely agrees with that of the small broad-leaved forms of *R. crassifolia*.

6. **R. Preissii,** *Moq. in DC. Prod.* xiii. ii. 49. A much branched slender divaricate undershrub, usually green or slightly hoary except the inflorescence which is whiter. Leaves mostly alternate, linear or linear-oblong, obtuse, contracted into a petiole, thick and fleshy, green or scarcely hoary, flat or with incurved margins, ½ to 1 in. long. Flowers and fruits of *R. crassifolia*, of which this may prove to be a variety with longer leaves and with the inflorescence usually more elongated and slender.—*R. linifolia*, Nees in Pl. Preiss. i. 637, not of R. Br.

W. Australia. Swan river, *Drummond*, *n.* 716, *Preiss*, *n.* 125; eastern interior of W. Australia, *Harper*.

7. **R. obovata,** *Moq. Chenop. Enum.* 10, *and in DC. Prod.* xiii. ii. 51. An erect scrubby shrub, more or less hoary or white. Leaves alternate or here and there opposite, from broadly ovate obovate or ovate-hastate to oblong, obtuse, contracted into a petiole, thick and fleshy, flat or slightly concave, equally hoary or mealy-white on both sides when young, the older ones often turning black or lead colour when dry, ½ to 1 in. long. Flowers as in the two preceding species in distinct clusters in a simple interrupted spike or slightly branched panicle, about the size of those of *R. Billardieri*. Fruiting perianth not exceeding the perfectly ripe fruit.

W. Australia. Sharks Bay, *Milne*, *Denham*. The specimens described by Moquin are said to be from the south and west coast of Australia, but were probably all from Sharks Bay, the Australian stations in the herbarium of the Paris Museum being very frequently erroneous.

8. **R. spinescens,** *R. Br. Prod.* 408. A divaricately branched rather slender shrub, usually low and straggling or prostrate, sometimes more erect and bushy and attaining several ft., mealy-white or at length nearly glabrous, the smaller branchlets often (but not always) terminating in slender spines. Leaves mostly alternate, obovate ovate orbicular or deltoid, in some specimens nearly ½ in. long, rather narrow, thin and but slightly mealy, in others all under ¼ in. broad, rather thick and very mealy-white, with many intermediate states, always flat or concave. Flowers small, polygamous, in small clusters or almost solitary in short terminal interrupted spikes or panicles, or almost

solitary in the upper axils. Fruit small (1¼ lines diameter when dry), the perianth expanded under it but not projecting beyond.—Moq. in DC. Prod. xiii. ii. 53.

Queensland. Burdekin river, *F. Mueller;* near Rockhampton, rare, *O'Shanesy;* Armadilla, *Barton.*

N. S. Wales Liverpool plains and Lachlan river, *A. Cunningham;* Darling river, *Mitchell;* and thence to the Barrier Range, *Victorian Expedition;* Castlereagh river, *C. Moore.*

Victoria. Murray and Avoca rivers, *F. Mueller.*

S. Australia. Spencer's Gulf, *R. Brown;* Cudnaka and Murray river, *F. Mueller;* Gawler Ranges, *Sullivan;* N.E. of Lake Gairdner, *Babbage.*

R. prostrata, A. Cunn. Herb.; Moq in DC Prod xiii. ii. 52, is described from specimens which have no spines, but which in all other respects agree with *R. spinescens,* and may be either an unarmed variety or a mere state in which the spines are not yet developed.

9. **R. hastata,** *R. Br. Prod.* 408. A procumbent or divaricately branched undershrub, spreading to 2 or 3 ft., green or slightly mealy-white when young. Leaves opposite or rarely alternate, petiolate, ovate-hastate or almost rhomboidal, very obtuse or emarginate, the basal lobes short obtuse or rarely acute, under 1 in. and often under ½ in. long. Flowers small, clustered, usually in compact simple or slightly branched spikes, either terminal or in the upper axils and shorter than the leaves, rarely more slender and elongate. Perianth-divisions oblong, not contracted at the base or stipitate as in *Chenopodium triangulare,* which this species sometimes resembles. Fruit ½ to ¾ line diameter, usually red.—Moq. in DC. Prod. xiii. ii. 53.

Queensland. Rockhampton, *Dallachy* and others; Nerkool Creek, *Bowman;* Moreton Bay, *Leichhardt, C. Stuart.*

N. S. Wales. Port Jackson, *R. Brown* and others; Liverpool plains, *A. Cunningham;* New England, *C. Stuart;* Hastings river, *Beckler.*

Victoria. Bacchus marsh, *F. Mueller.*

10. **R. nutans,** *R. Br. Prod.* 408. Herbaceous, prostrate or procumbent and slender, often extending to 1 to 2 ft., green or the young foliage more or less mealy-white, the stems rarely almost woody at the base. Leaves opposite or here and there alternate, on rather slender petioles, from broadly hastate with very prominent basal lobes to lanceolate and angular only at the base, always acute, rather thin and green, rarely 1 in. long and often all under ½ in., the upper ones gradually smaller. Inflorescence simple or with a few short branches, terminal or in the upper axils, under 1 in. long or rarely elongated, sometimes nodding at the end, sometimes slightly leafy at the base, with one or two solitary flowers or small clusters in the axils of the upper leaves. Flowers very small, the males with 2 or 3 stamens and a rudimentary pistil, the females without any or with only 1 stamen. Fruit about ½ line diameter, the pericarp red and succulent when fresh, thin when dry.—Moq. in DC. Prod. xiii. ii. 53; Hook. f. Fl. Tasm. i. 312.

Queensland. Brisbane river, *F. Mueller;* Curriwillighie, *Dalton.*

N. S. Wales. Lachlan river, *A. Cunningham;* Lachlan and Darling rivers to the

Barrier Range, *Victorian and other Expeditions;* Hastings river, *Beckler;* Bellanbel river, *Locker.*

Victoria. Wando vale, *Robertson;* Tambo river, *F. Mueller;* Creswick, *Whan.*

Tasmania. Derwent river, *R. Brown, J. D. Hooker;* abundant in plains near Ross, *Gunn;* S. Esk river, *C. Stuart.*

S. Australia. Kangaroo island, *R. Brown;* Murray river, Salt Creek, Port Adelaide, *F. Mueller;* towards Cooper's Creek, *Wheeler, Howitt's Expedition.*

12. **R. linifolia,** *R. Br. Prod.* 408. A diffuse or procumbent herb or undershrub, more slender even than *R. nutans* and like that species green or the young shoots very slightly mealy. Leaves alternate, linear or linear-lanceolate, rather acute, contracted into a short petiole, thin and green on both sides, from under ½ in. to nearly 2 in. long. Inflorescence almost filiform, rarely above 1 in. long, simple or slightly branched or forming a slender divaricate leafy panicle. Flowers very small, solitary or in small clusters, the females mostly pedicellate. Perianth glabrous. Fruit smaller than in any other species, the pericarp red and pulpy when fresh, thin when dry.—Moq. in DC. Prod. xiii. ii. 49.

Queensland. Broad Sound, *R. Brown;* Bay of Inlets, *Banks and Solander;* in the interior, *Mitchell;* Curriwillighie, *Dalton;* Darling Downs, *Law;* Rockhampton, *O'Shanesy.*

N. S. Wales. Hunter's river, *A. Cunningham;* in the interior, *Leichhardt;* Camden district, *Woolls;* New England, *C. Stuart;* Bellanbel river, *Locker.*

2. CHENOPODIUM, Linn.

(Ambrina, *Moq.*, Blitum, *Moq.* (*partly*).

Flowers hermaphrodite or rarely polygamous. Perianth herbaceous, deeply divided into 5 or rarely 4 or 3 lobes or segments which are obtuse and concave or rarely acute and erect, scarcely altered or slightly enlarged after flowering. Stamens 5 or fewer, filaments filiform or flattened. Ovary globular or ovoid; styles 2 or rarely 3, usually united at the base. Fruit depressed or ovoid, partially or completely covered by the persistent perianth, pericarp dry, membranous, distinct from or inseparable from the seed. Seed horizontally flattened, or vertical and less compressed; testa crustaceous; embryo circular, enclosing a mealy albumen.—Herbs or rarely shrubs or undershrubs. Leaves alternate, flat, entire toothed or divided. Flowers small, sessile in clusters, either axillary or in interrupted terminal spikes or panicles.

The genus is widely distributed over the globe, but appears to be really indigenous chiefly in temperate and subtropical regions, some species, including four of the Australian ones, probably of European origin, are amongst the most generally dispersed weeds of cultivation. Of the remaining eight Australian species one is also in New Zealand and New Caledonia, the other seven appear to be endemic although one of them is perhaps too closely connected with an East Asiatic one.

The precise limits to be assigned to the genus are as yet very uncertain. The last four species here included, with the seeds all erect and the inflorescence axillary, are certainly nearly allied to the European *Bliti* originally characterized by the succulent perianth, but recently extended to the majority of *Chenopodia* with erect seeds. The adoption of the latter character entails however the assigning *C. nitrariaceum* and *C.*

Bonus henricus to *Blitum*, a most unnatural combination, and leaves *C. glaucum* and *C. rubrum*, in which the seeds of some of the flowers are often erect, ambiguous between the two genera. I have therefore followed F. Mueller in reuniting them, at least as to the Australian species, and the very variable consistence of the fruiting perianth in *C. carinatum* and *C. rubrum*, leaves it very doubtful whether even the Linnean *Blita*, with their berry-like fruits, can be distinctly separated from *Chenopodium.*

SECT. 1. **Rhagodioides.**—*Spinescent shrub. Flower-clusters in terminal spikes. Seeds vertical.*

Plant hoary or mealy-white. Leaves entire . . . . 1. *C. nitrariacea.*

SECT. 2. **Chenopodiastrum.**—*Herbs mealy-white or glabrous. Flower-clusters in terminal or axillary spikes or panicles. Seeds all or mostly horizontal.*

Erect and mealy-white or almost glabrous. Spikes terminal, often paniculate.
Leaves (usually very hoary or white) entire or very rarely hastate 2. *C. auricomum.*
Leaves (green or mealy-white underneath or on both sides) at least the lower ones coarsely sinuate-toothed . . . . . . 3. *C. album.*
Erect green annual. Cymes or panicles axillary and loose.
Leaves broad, coarsely-toothed . . . . 4. *C. murale.*
Decumbent or prostrate herbs (mostly annual).
Leaves entire or hastate. Stamen usually 1.
Stems weak and elongated. Leaves green or scarcely mealy. Flower-clusters in terminal interrupted spikes . . . . . 5. *C. triangulare.*
Stems short, much branched. Leaves small, mealy. Flower-clusters small in the upper axils or scarcely spicate . . . 6. *C. microphyllum.*
Lower leaves sinuate-toothed, mostly green above, white underneath. Stamen usually 1 . . . . 7. *C. glaucum.*

SECT. 3. **Botryois.**—*Erect glandular aromatic herbs or undershrubs not mealy. Seeds all or mostly horizontal.*

Leaves narrow, mostly sinuate-toothed. Flower-clusters axillary, forming a leafy panicle . . . . 8. *C. ambrosioides.*

SECT. 4. **Orthosporum.**—*Decumbent glandular herbs not mealy. Seeds all vertical. Flower-clusters all axillary.*

Perianth-segments broad, concave with a thickened keel . . . 9. *C. carinatum.*
Perianth-segments narrow, nearly erect, with a thickened keel. Minute filiform plant . . . . 10. *C. pumilio.*
Perianth-segments linear, erect, the keel dilated into a broad fringed wing or crest . . . . 11. *C. cristatum.*
Perianth-segments lanceolate, erect, the keel much thickened and angular at the base . . . . 12. *C. atriplicinum.*

SECT. 1. RHAGODIOIDES.—Spinescent shrub. Flower-clusters in terminal spikes. Seeds all vertical.

1. **C. nitrariacea,** *F. Muell.* A rigid divaricately branched or prostrate shrub or undershrub, hoary or mealy-white all over with a minute tomentum, the smaller branchlets often spinescent but not nearly so slender as in *Rhagodia spinescens.* Leaves alternate, sometimes clustered at the base of the flowering branchlets, linear oblong or linear-spathulate, very obtuse, entire, contracted into a short petiole, from under ½ in. to nearly 1 in. long. Flowers sessile, usually clustered in interrupted or dense spikes, either simple and terminal or forming short divaricate branches to a terminal panicle, mostly hermaphrodite

with a few males intermixed. Perianth-segments broad, thick, concave, slightly imbricate in the bud. Stamens 5, shortly exserted, the filaments flat and glabrous. Ovary ovoid, erect, the styles short, rather thick, united at the base. Fruit enclosed in the unaltered perianth. Pericarp membranous. Seed erect, flat: embryo circinate, the radicle usually inferior.—*Rhagodia nitrariacea*, F. Muell. in Trans. Phil. Inst. Vict. ii. 73.

N. Australia. N.W. coast, *Bynoe*, the specimens in bud and in some measure doubtful.

N. S. Wales. Darling river, *Victorian Expedition, Mrs. Ford.*

Victoria. Murray and Avoca rivers, *F. Mueller.*

W. Australia. Swan river, *Drummond.*

Some other specimens referred to this species by F. Mueller appear to me to belong to *Rhagodia spinescens*, but are too young to determine. In all those which I have quoted as typical, I have uniformly found the seed, either already enlarged after flowering or quite ripe, erect and enclosed in a thin dry pericarp.

SECT. 2. CHENOPODIASTRUM, Moq.—Herbs, mealy-white or glabrous. Flower-clusters in terminal or axillary spikes or panicles. Seeds all or mostly horizontal.

2. **C. auricomum,** *Lindl. in Mitch. Trop. Austr.* 94. Erect and probably tall, more or less white or hoary all over, apparently herbaceous and not spinescent. Leaves on rather long petioles, ovate or oblong, very obtuse, entire or rarely hastate with prominent basal lobes, mostly ¾ to 1½ in. long. Flowers in little dense globular clusters along the branches of a terminal panicle, sometimes distinct and rather distant, sometimes crowded into dense spikes. Perianth-segments broad, concave, closing over the fruit. Stamens 5, shortly exserted. Ovary small, globular, contracted into a long neck or united base of the styles. Pericarp depressed-globose, membranous. Seed very flat, horizontal. Embryo annular.—Moq. in DC. Prod. xiii. ii. 460.

N. Australia. Upper Victoria river and Sturt's Creek, *F. Mueller*; Gulf of Carpentaria, *Landsborough;* in the interior, *M'Douall Stuart's Expedition.*

Queensland. Narran river, *Mitchell;* Curriwillighie, *Dalton;* Sutter and Bowen rivers, *Bowman.*

N. S. Wales. Darling river and Duroadoo, *Victorian Expedition.*

This species undoubtedly comes near to some forms of *C. album*, differing in its entire more tomentose leaves and larger flowers. It appears to be still more closely allied to and perhaps not really distinct from the East Asiatic *C. acuminatum*, Willd.

C. furfuraceum, Moq. in DC. Prod. xiii. ii. 64, from the Straits of Entrecasteaux, **Tasmania,** is unknown to me. The character given agrees with that of *C. auricomum*, of which however I have seen no specimen from Tasmania, nor from the south coast of the continent of Australia.

3. **C. album,** *Linn.; Moq. in DC. Prod.* xiii. ii. 70. A tough annual usually erect, 1 to 2 ft. high, of a pale green or more or less mealy-white, especially the flowers and the under side of the leaves. Leaves petiolate, the lower ones ovate or rhomboidal, more or less sinuate-toothed or angular, the upper ones usually narrow and entire. Clusters of flowers in short dense or interrupted spikes, simple or slightly branched, the lower ones axillary, the upper ones or sometimes nearly

all in a long terminal panicle leafy at the base. Segments of the fruiting perianth broad, concave, somewhat thicker in the centre or keeled, contracted and united at the base, completely closing over the fruit. Stamens usually 5. Seeds all horizontally flattened, smooth and shining, the pericarp exceedingly thin.—*C. lanceolatum*, R. Br. Prod. 407; Moq. in DC. Prod. xiii. ii. 62; *C. Brownianum*, Roem. and Schult. Syst. vi. 275.

Queensland. Neikool Creek, *Bowman*; Armadilla, *Barton*; Warwick, *Beckler* (the specimen bad and somewhat doubtful).

N. S. Wales. Paterson's river, *R. Brown*; Liverpool plains, *Leichhardt*; Paramatta, *Woolls*.

Victoria. Melbourne, *Adamson*; Bacchus marsh and Snowy river, *F. Mueller*; Skipton, *Whan*.

W. Australia. *Drummond*, *n.* 224.

The species is a very common weed in Europe and temperate Asia, and has spread as such over many other parts of the world. Whether it be really indigenous or introduced only into Australia is uncertain. In N. S. Wales and Queensland it is said to be known under the name of *Fat Hen*.

C. biforme, Nees in Pl. Preiss. i. 636, from Swan river, *Preiss*, *n.* 1256, described from a single specimen which I have not seen, may be one of the numerous forms of *C. album*. It is described as having the inflorescence flowers and indumentum of *C. album*, but with the leaves, especially in their dentation, more like those of *C. murale*, to which Moquin refers it in DC. Prod. xiii. ii. 69.

4. **C. murale,** *Linn.*; *Moq. in DC. Prod.* xiii. ii. 69. A rather stout erect or decumbent much branched annual, from under 1 ft. to nearly 2 ft. high, usually green, but sometimes with a slight whitish meal on the young shoots. Leaves on long petioles, broadly ovate triangular or rhomboidal, deeply and irregularly toothed, 1 to above 2 in. long. Flowers small, green or slightly mealy, the clusters in much-branched rather slender spikes, forming loose leafless cymes or panicles usually much shorter than or rarely as long as the leaves, almost all axillary, rarely lateral or terminal. Segments of the fruiting perianth broad, concave, somewhat keeled, closing over the fruit or nearly so. Stamens usually 5. Seeds all horizontally flattened, opaque or somewhat rugose, the margins thick and obtuse or thin and acute. Pericarp not readily separable from the seed.—*C. erosum*, R. Br. Prod. 407; Moq. in DC. Prod. xiii. ii. 68; Hook. f. Fl. Tasm. i. 313.

Queensland. Rockhampton, rare, *O'Shanesy*.

Victoria. Near Melbourne, Murray river, and Gipps Land, *F. Mueller*.

Tasmania. Kent's Group, Bass's Straits, *R. Brown*.

This is another European weed now widely dispersed over various temperate and warm regions of the globe. The Australian specimens I have seen are mostly single ones, and it is therefore probably introduced only. Brown's specimens have the inflorescences more compact, but they are still in young bud and some European ones are precisely similar to them.

5. **C. triangulare,** *R. Br. Prod.* 407. Stems weak procumbent or straggling, extending sometimes to 2 ft. or more, the whole plant green or with but little of white meal on the young shoots. Leaves on rather long petioles, from ovate to oblong or to broadly hastate in the typical form, obtuse or shortly mucronate, under 1 inch long, the upper ones often and sometimes all lanceolate. Flowers very small, in clusters or

little cymes in a terminal interrupted spike or along the short distant branches of a slender terminal panicle, or the lower ones in the axils of the upper leaves. Perianth-segments broad and concave, sometimes closing over and covering the fruit, sometimes smaller and much contracted at the base. Stamen usually 1. Styles short. Seed flat, horizontal, about ½ line diameter, in a very thin membranous pericarp.—*C. trigonon*, Roem. and Schult. Syst. vi. 275; Moq. in DC. Prod. xiii. ii. 65.

Queensland. Armadilla, *Barton.*
N. S. Wales. Paramatta, *Wool's;* Namoi river, *Leichhardt;* New England, *C. Stuart.*

The habit is nearly that of *Rhagodia hastata*, but the fruit is never succulent, and the inflorescence rather different. The *C. triangulare* of Forskahl being reduced by Moquin to *C. murale*, there seems no reason to suppress Brown's name of *C. triangulare* for the present species.

Var. *stellulatum.* Perianth-segments with a rather small concave lamina contracted at the base into a linear stipes (reduced to the somewhat prominent midrib). Leaves of the typical form.—New England, *C. Stuart.*

Var. *angustifolium.* Leaves linear-lanceolate or the lower ones lanceolate-hastate. Perianth of the typical form.—To this belong the Queensland specimens and some from New England.

6. **C. microphyllum,** *F. Muell. in Trans. Phil. Inst. Vict.* ii. 74. A small much-branched prostrate or diffuse plant apparently perennial and more or less mealy-white. Leaves numerous, small, petiolate, ovate rhomboidal triangular or broadly lanceolate, entire, 2 to 3 lines long, hoary or white on both sides or becoming nearly green above. Flowers few together in small rather loose clusters in the upper axils, scarcely forming very short terminal spikes. Perianth very scaly, mealy, the segments concave, shortly united and keeled but not contracted at the base. Stamen usually 1. Seed flat, horizontal.

N. S. Wales. On the Billabong, *W. Bissett.*
Victoria. Bacchus marsh, *F. Mueller;* Wimmera, *Dallachy.*
S. Australia. Near the Barossa Range, *Behr.;* Enfield, *F. Mueller.*

7. **C. glaucum,** *Linn.; Moq. in DC. Prod.* xiii. ii. 72. An annual, much-branched diffuse and prostrate or decumbent at the base, the stems ascending to 1 ft. or more, glabrous striate and furrowed. Leaves petiolate, the lower ones broadly lanceolate or almost rhomboidal or hastate, coarsely sinuate-toothed, often above 1 in. long, the upper ones gradually smaller narrower and more entire, the uppermost passing into small bracts, all green above and more or less white underneath. Flowers small, nearly glabrous, in clusters or short leafless irregular spikes, the lower clusters or spikes axillary and much shorter than the leaves, the upper ones forming terminal interrupted spikes leafy at the base only. Perianth-segments rather thin, or the keel somewhat thickened, closely appressed on the fruit but not completely covering it. Stamen usually 1 only. Fruits about ½ line diameter, mostly depressed with a horizontally flat seed, but some of the lateral ones occasionally with a vertical seed and the perianth-segments reduced to 4 or 3.—

Hook. f. Fl. Tasm. i. 313; *C. ambiguum*, R. Br. Prod. 407; Moq. in DC. Prod. xiii. ii. 67.

N. S. Wales. Paramatta, *Woolls;* Ash island, *Beckler.*
Victoria. Along the coast from the Glenelg, *Robertson* and others, to Gipps Land, *F. Mueller* and others.
Tasmania. Port Dalrymple, *R. Brown;* common on the sea-coast near high-water mark, *J. D. Hooker.*
S. Australia. Kangaroo island, *R. Brown;* Bethanie, *F. Mueller.*
W. Australia. *Drummond, n.* 225 (in some herbaria 235); Port Gregory, *Oldfield.*

The species is common in many parts of Europe and temperate Asia, and occurs here and there in other parts of the globe.

C. littorale, Moq. in DC. Prod. xiii. ii. 65, described from a specimen of Caley's in the Paris Herbarium, which I have not seen, may, from the character given, be a form either of this species or of *C. album.*

SECT. 3. BOTRYOIS, Moq.—Glandular aromatic herbs or undershrubs, not mealy. Seeds all or nearly all horizontal.

*8. **C. ambrosioides,** *Linn.; Moq. in DC. Prod.* xiii. ii. 72. An erect much-branched annual of 1 to 2 ft., not mealy but more or less glandular-dotted and strongly aromatic. Leaves lanceolate or oblong, acute or obtuse, the lower ones irregularly toothed or sinuate, contracted into a short petiole, from under 1 in. to above 2 in. long, the upper ones smaller and entire, passing into small linear or linear-lanceolate acute petiolate bracts, all green on both sides, glandular underneath. Flowers very small and numerous, solitary or clustered in the axils of bracts which are either minute or leafy and longer than the clusters, the clusters forming more or less leafy slender interrupted spikes, arranged in a large leafy panicle occupying the greater part of the plant. Fruiting perianth about ½ line diameter, the lobes short, completely or almost completely covering the fruit. Seeds smooth and shining, all or mostly horizontal.

Queensland. Moreton Bay, *F. Mueller;* Rockhampton, *O'Shanesy.*
N. S. Wales. Port Jackson, *R. Brown* and others; New England, *C. Stuart.*
W. Australia, *Drummond, n.* 207.

A common weed in southern Europe, northern Africa, and western Asia, and spread with cultivation over many parts of the world. It is probably introduced only into Australia as suggested in R. Brown's notes, and on that account omitted in his Prodromus.

SECT. 4. ORTHOSPORUM, R. Br.—Decumbent glandular herbs not mealy. Seeds all vertical. Flower-clusters all axillary.

9. **C. carinatum,** *R. Br. Prod.* 407. Stems much-branched and procumbent or prostrate at the base, ascending to from ½ to 1 ft. or more, the whole plant more or less glandular-pubescent. Leaves on long petioles, ovate or oblong, obtuse, coarsely sinuate-toothed, usually rather thick and rugose, glandular-scabrous on both sides, ½ to 1 in. long, the upper floral ones often much reduced, and sometimes all the leaves almost orbicular and small. Flowers small, in dense globular clusters in almost all the axils, the upper ones sometimes forming interrupted more or less leafy spikes. Perianth-segments erect, incurved,

broadly oblong, concave and almost boat-shaped, with a thickened broad obtuse keel, more or less pubescent or hirsute. Stamen usually 1. Fruit small, ovoid, erect, the pericarp inseparable from the seed.—*Salsola carinata*, Spreng. Syst. i. 923; *Ambrina carinata*, Moq. Chenop. Enum. 41; *Blitum carinatum* and *B. glandulosum*, Moq. in DC. Prod. xiii. ii. 81, 82; *Chenopodium glandulosum*, F. Muell. Fragm. vii. 11.

Queensland. Moreton Bay, *W. Hill, F. Mueller*, and others; Peak Downs, *F. Mueller*; Rockhampton, *O'Shanesy*; Armadilla, *Barton*.

N. S. Wales. Port Jackson, *R. Brown, J. D. Hooker*; Benella, *Leichhardt*; Clarence river, *Beckler*; Murray and Darling rivers, *Victorian and other Expeditions*.

Victoria. Yarra-Yarra, *F. Mueller*; Skipton and Creswick, *Whan*; Lockwood, *Bissil*.

S. Australia. Bethanie, *Behr.*; Mount Barker, Lofty Ranges, Lake Torrens, *F. Mueller*.

W. Australia, *Drummond, n.* 165, 715.

The species is also in New Zealand and New Caledonia. In most of Drummond's specimens and in some others, the fruit or perianth has a tendency to dry black and become rather thick, showing an approach to the European typical *Blita*.

10. **C. pumilio,** *R. Br. Prod.* 407. A branching decumbent filiform annual of about 1 in., more or less hoary with crisped or glandular hairs. Leaves on slender petioles, ovate or oblong, entire, 1 to 2 lines long. Flowers minute, axillary, solitary or 2 or 3 together on very short pedicels. Perianth-segments 4 or 5, linear, erect, concave, slightly incurved, nearly ½ line long when in fruit, hirsute with a few crisped hairs.—*Blitum pumilio*, Moq. in DC. Prod. xiii. ii. 82; *Ambrina pumilio*, Moq. Chenop. Enum. 42.

S. Australia. Kangaroo island, *R. Brown*. Possibly a diminutive form of *C. carinatum*.

11. **C. cristatum,** *F. Muell. Fragm.* vii. 11. Diffuse or procumbent, with ascending flowering branches of 1 ft. or more, the whole plant slightly glandular-pubescent. Leaves on long petioles, from ovate to oblong-lanceolate, obtuse, coarsely toothed, narrowed at the base, ½ to 1 in. long, green and glandular-scabrous on both sides. Flowers in dense globular clusters, all axillary. Perianth-segments linear, erect, not incurved, acute, about 1 line long when in fruit, the keel dilated into a broad fringed crest or wing. Fruit ovoid, erect, enclosed in the perianth. Styles very slender.—*Blitum cristatum*, F. Muell. in Trans. Phil. Inst. Vict. ii. 73.

N. S. Wales. Darling river, *Victorian Expedition*.

Victoria. Murray river, *F. Mueller*.

S. Australia. Flinders Range, *F. Mueller*.

12. **C. atriplicinum,** *F. Muell. Fragm.* vii. 11. Apparently perennial, branching at the base only, with numerous ascending or erect stems under 1 ft. and often under 6 in., flowering from near the base, of a pale green and slightly glandular-pubescent. Lower leaves on long slender petioles, from lanceolate to broadly hastate, otherwise entire, rather thick, ¾ to 1 in. long, the upper ones smaller lanceolate and entire, but all petiolate. Flowers in dense sessile axillary clusters

shorter than the petioles. Perianth-segments 4 or 5, erect, lanceolate, rather above 1 line long, the points somewhat spreading, the keel much thickened and irregularly angular at the base. Stamen 1. Seed erect, rugose, enclosed in the perianth.—*Blitum atriplicinum*, F. Muell. in Trans. Vict. Inst. 1855, 133, and in Hook. Kew Journ. viii. 204.

N. S. Wales. Darling desert, *Victorian Expedition.*
Victoria. Wimmera, *Dallachy.*
S. Australia. Flinders Range, *F. Mueller.*

3. DYSPHANIA, R. Br.

Flowers polygamous. Perianth of 1 to 3 minute segments, which when in fruit are clavate, concave or hood-shaped, white and almost transparent. Stems 1 to 3. Ovary ovoid: styles 1 or 2, very finely filiform. Fruit ovoid, the pericarp inseparable from the seed. Seed erect, testa crustaceous with a very thin membranous inner integument. Embryo circular enclosing a mealy albumen; radicle inferior.—Small annuals. Leaves alternate, flat, entire. Flowers minute, in clusters either all axillary or in terminal spikes, the females numerous, the hermaphrodite ones few in each cluster.

The genus is limited to Australia. It is nearly allied to the section *Orthosporum* of *Chenopodium*, but readily distinguished by the remarkable perianth.

Fruiting perianth of 3 (rarely 2) segments falling off with the fruit. Style 1. Plant of 1 to 3 in.
Flower-clusters forming a dense terminal leafless spike . . . 1. *D. plantaginella.*
Flower-clusters closely contiguous but axillary, forming a leafy spike . . . . 2. *D. littoralis.*
Fruiting perianth usually of a single segment. Styles 2. Plant of 3 to 6 in. Flower-clusters all axillary and distinct . . . 3. *D. myriocephala.*

1. **D. plantaginella,** *F. Muell. Fragm.* i. 61. An erect branching annual of 1 to 3 in., slightly glandular-hairy. Stem leaves in the lower part of the plant petiolate, ovate or obovate, obtuse, entire, 2 to 4 lines long. Flowers resembling those of *D. littoralis*, but the clusters crowded in dense terminal cylindrical leafless spikes of 1 to 2 in., and consequently occupying the greater portion of the plant. Perianth of 3 obovate-clavate concave segments, about ¼ line long, and falling off with the fruit. Style 1, very deciduous.

N. Australia. Sturt's Creek, *F. Mueller.*

2. **D. littoralis,** *R. Br. Prod.* 411. A small plant apparently annual, although sometimes hard and perhaps fleshy at the base, with ascending branching stems of 2 to 3 in., glabrous or nearly so. Leaves all petiolate, ovate or oblong, obtuse, entire, rather thick and sometimes fleshy, not above 2 lines long. Flower-clusters all axillary, but nearly all close together, forming a terminal leafy spike occupying the greater part of the plant, the lower clusters sometimes rather more distant. Flowers numerous in the cluster, chiefly females. Perianth of 3 or rarely 2 segments falling off together and enclosing the fruit, the segments all equal, obovate, clavate, concave, contracted at the base, about ¼

line long. Fruit still shorter, obovoid, somewhat oblique; style 1, very finely filiform and very deciduous. Stamens 1 or 2 but difficult to find, the anthers falling off early from the very minute flowers.

N. Australia. Moist salt places on the N. coast (snatched up in the hurry of escape from an armed native in close pursuit, and never seen again), *R. Brown.*

S. Australia. Flooded ground S. of Wills Creek, *Howitt's Expedition.*

3. **D. myriocephala,** *Benth.* A diffuse or procumbent glabrous or slightly glandular-pubescent annual, much larger than the two preceding species, although the ascending branching stems rarely exceed 6 in. Leaves petiolate, oblong or lanceolate, obtuse or scarcely acute, rarely above ¼ in. long. Flower-clusters all axillary and distinct, very numerous, occupying the greater part of the plant, globular and scarcely exceeding 1 line in diameter when in fruit, and often much smaller, although containing 10 to 20 or even more flowers, chiefly females, with a very few hermaphrodite or male ones. Segments of the fruiting perianth single and falling off separately, about ½ line long, obovoid-clavate and as it were inflated, shortly contracted at the base. Seed ovoid like that of *D. littoralis*, but more regular and slightly flattened; styles 2, very fine, but shorter than the single one of *D. littoralis*. Stamens 1 or 2, with very short broad filaments and comparatively large anthers.—*D. littoralis*, Moq. in DC. Prod. xiii. ii. 86, not of R. Br.

Victoria. Sandy occasionally flooded banks of the Murray near the junction of the Golgol, *F. Mueller.*

W. Australia, *Drummond, n.* 206.

Moquin's description is taken from a specimen of Drummond's in which he had correctly observed the two styles, but in which I have always found in every cluster as many or nearly as many fruits as enlarged perianth-segments, but as these fall off separately, it is difficult to ascertain whether there may not sometimes be two to one fruit. Moquin in describing three has probably followed Brown's character founded on the true *D. littoralis.*

4. ATRIPLEX, Linn.

(Obione and Theleophyton, *Moq.*)

Flowers unequal. Male perianth nearly globular, deeply divided into 5, rarely fewer segments. Stamens 5 or fewer. Female perianth very small at the time of flowering, 2-toothed or 2-lobed, enclosing the ovary. Styles 2, free or united at the base. Fruiting perianth much enlarged and variously shaped, the tube very small or large, flat or variously thickened, the limb of 2 variously shaped segments or *valves* closely appressed, at least at the margin (except in A. *campanulata*), entire or toothed. Fruit entirely enclosed in the tube or between the valves. Pericarp membranous, very thin. Seed compressed, vertical; testa crustaceous, often thin with a very thin inner integument sometimes scarcely distinct. Embryo surrounding a mealy albumen, the radicle superior lateral or inferior.—Herbs or shrubs, more or less mealy or scaly-tomentose. Leaves alternate or the lower ones rarely opposite, flat, entire hastate or sinuate-toothed. Male flowers in globular clusters, either detached from the females in close or interrupted simple or paniculate spikes, or axillary and then each cluster usually surrounded by females; female flowers usually in axillary clusters, rarely solitary or the clusters in terminal leafless panicles. Bracts subtending the male as well as the female flowers usually minute, or quite obsolete.

The genus is widely distributed over most parts of the globe, chiefly in maritime or subsaline districts, some species also frequenting rich cultivated grounds. Of the thirty Australian species, one is a common European weed of cultivation possibly of modern introduction into Australia, two are also in New Zealand, the others appear all to be endemic, for although one is nearly allied to a New Caledonian species, another to a South African one, and others may be more or less compared with other exotic ones, there are none which I have been able precisely to identify. The specific characters are in many instances taken chiefly from the fruiting perianths, which are so extraordinarily diversified in the genus, and which evidently vary also to a certain degree even on the same individual. It may therefore possibly be shown hereafter that in some instances the distinctions here relied upon may not prove sufficiently constant to retain their specific value.

Moquin, relying apparently on observations communicated by Fenzl, considers that the lobes or valves of the female perianth of *Atriplex* are really bracts (bracteoles), for, he says, in monstrous female flowers of *Atriplex* and normally in *Exomis*, minute perianth segments occur within these bracts. Trusting implicitly to his observations I should, with most recent botanists, have adopted his views, but that, on a careful examination of the various forms assumed by this perianth in Australian species and of its structure at the time of flowering, I could by no means reconcile its insertion and development with any other view than that of its being the homologue of the male perianth. This induced me to examine a considerable number of flowers and fruits of both species of *Exomis*. In *E. albicans* I find the structure quite that of *Atriplex*, nor can I discover anything that might be taken for minute perianth-segments unless it be sometimes some rudimentary stamens. A small additional perianth-lobe occurred once, not inside of the two valves, but in their sinus on one side, and I have occasionally but very rarely seen three valves to the perianth of *Atriplex*. In *Exomis axyrioides* the case is quite different. I find the female perianth abortive or reduced to minute scales and the quasi-petiolate bracts described by Moquin appear to me to be real subtending bracts or floral leaves, one only to each flower, although when in fruit, owing to the abortion of some of the ovaries, there may be 2 or 3 bracts to one fruit, but never two opposite ones united at the base and enclosing the fruit, as in *Atriplex* and in *Exomis albicans*, which latter species ought surely to be restored to *Atriplex*.

A few modern botanists have, after Pliny, treated the name *Atriplex* as of the neuter instead of the feminine gender. As there is classical authority for both, I have preferred following Linnæus, De Candolle and the great majority of botanists in treating it as feminine.

In the arrangement of the Australian species I have been unable to retain Moquin's distinction between *Atriplex* and *Obione* even as sectional. The thickening of the perianth over the fruit may be observed in every degree from flat and membranous to hard and terete, and in species so closely allied as *A. inflata* and *A. holocarpa*, or as *A. Drummondii* and *A. isatidea*, the radicle is superior in the one and inferior or lateral in the other. The deviation from the normal position of the seed, transverse instead of parallel to the valves, in *A. Billardieri* is remarkable, but is scarcely sufficient for separating, on that character alone, a single species from a large genus otherwise so natural and so well defined.

SERIES 1. **Paniculatæ.**—*Diœcious or semidiœcious scaly tomentose shrubs, the male clusters in more or less branched or paniculate dense or interrupted leafless spikes.*

Diœcious, both sexes paniculate.
  Fruiting perianths flat.
    Fruiting perianths reniform. Spikes in male panicles interrupted.
      Fruiting perianths on a slender stipes . . . . 1. *A. stipitata.*

Fruiting-perianths sessile . . . . 2. *A. Moquiniana.*

Fruiting perianths ovate or broadly cordate, with a short solid base or stipes. Leaves narrow (female inflorescence more simple and leafy) . . . . 3. *A. paludosa.*

Fruiting perianths ovate or slightly cordate, quite sessile. Leaves mostly obovate. Female panicles more branched 4. *A. Drummondii.*

Fruiting perianths with thick convex valves.

Leaves elliptical or oblong, 1½ to 3 in. Female panicles branched . . . . 5. *A. isatidea.*

Leaves mostly orbicular, ½ to 1 in. Female inflorescence more simple and leafy . . . . 6. *A. nummularia.*

Semi-diœcious. Female flowers solitary or very few in the axils of the stem-leaves of the male plants, more clustered but all axillary in the females.

Leaves mostly oblong. Fruiting perianths broadly triangular or rhomboid, flat or thickened over the fruit, with a turbinate solid base . . . . 7. *A. cinerea.*

Leaves ovate or lanceolate sometimes hastate. Fruiting perianths thickened to the margin.

Fruiting perianths 1½ to 3 lines diameter . . . . 8. *A. rhagodiodes.*

Fruiting perianths 4 to 5 lines diameter . . . . 9. *A. incrassata.*

SERIES 2. **Vesicariæ.**—*Small bushy or decumbent more or less scaly tomentose shrubs, diœcious or monœcious. Male flowers in short terminal dense spikes, females axillary. Fruiting perianth orbicular, membranous, with large membranous appendages on each face.*

Leaves obovate or oblong-lanceolate, usually white, 4 to 8 lines long. Eastern species mostly monœcious . . . . 10. *A. vesicaria.*

Leaves narrow, less white, mostly 2 to 4 lines long. Western species mostly diœcious . . . . 11. *A. hymenotheca.*

SERIES 3. **Oleraceæ.**—*Monœcious annuals usually tall or spreading green or slightly mealy. Flowers clustered in the axils and in terminal panicles. Valves of the fruiting perianth flat or muricate. (Introduced species.)*

Erect plant of 4 or 5 ft. Leaves broad. Flowers crowded in a long panicle. Fruiting perianth broad, thin and flat, the valves free to the base . . . . * *A. hortensis.*

Erect and 2 or 3 ft., or spreading or procumbent. Leaves narrow except the lower ones. Flowers usually in distant clusters.

Fruiting perianth thickened at the base, the valves united to near the middle . . . . 12. *A. patula.*

SERIES 4. **Glomeratæ.**—*Monœcious decumbent procumbent or spreading herbs, scaly tomentose or very rarely green. Male flowers in globular clusters surrounded by a few females in the upper axils or rarely forming a short terminal spike, females clustered in the lower axils without males. Fruiting perianths more or less compressed, conspicuously 2-valved.*

Fruiting perianth flat, rhomboidal, the valves free almost or quite to the base, closing over the fruit.

Leaves narrow, entire. Male flowers in short terminal compact spikes. Fruiting perianth with a small turbinate solid base . . . . 13. *A. humilis.*

Leaves broad, mostly sinuate. Male flowers axillary or the upper ones spicate. Fruiting perianth triangular with a broad base . . . . 14. *A. velutinella.*

Fruiting perianth with a compressed turbinate base half enclosing the fruit, shorter than or not longer than the valves

Leaves nearly orbicular, about 1 in. diameter. Fruiting perianth stipitate, the valves more than twice as broad as the tube . . . . 15. *A. angulata.*

Leaves narrow, usually green, ½ to 1 in. long. Fruiting perianth sessile, rhomboidal, the valves not broader than the tube . . 16. *A. semibaccata.*
Leaves 2 to 3 lines long. Fruiting perianth rhomboidal, about 1 line diameter, with a short solid base . . . . 17. *A. exilifolia.*
Fruiting perianth with a globular ovoid or slightly compressed tube enclosing the fruit, the valves shorter than the tube.
Spreading (or erect ?). Leaves broad, mostly toothed and 2 in. long or more. Fruiting perianth 1 to 1½ lines diameter . . 18. *A. Muelleri.*
Diffuse. Leaves obovate or oblong, rarely above 2 lines long. Fruiting perianth 1 to 1¼ lines diameter . . . . 19. *A. elachophylla.*
Procumbent. Leaves narrow, ¼ to ½ in. long. Fruiting perianths clustered, nearly 1 line diameter . . . . 20. *A. microcarpa.*
Prostrate. Leaves narrow, 1 to 2 lines long. Fruiting perianths clustered, scarcely ½ line diameter . . . . 21. *A. prostrata.*
Procumbent. Leaves ovate, 1 to 1½ lines long. Fruiting perianths 1 or 2 in the axils, scarcely ½ line diameter . . . . 22. *A. pumilio.*
Fruiting perianth minute, the valves free, spreading. Small erect plant glabrous and green. Leaves 2 lines long . . . . . . 23. *A. glomulifera.*
Fruiting perianth with an obliquely campanulate slightly compressed tube with appendages on the shorter face. Valves toothed, unequal and scarcely appressed . . . . 24. *A campanulata.*

SERIES 5. **Parviloba.**—*Monœcious spreading or procumbent herbs or undershrubs scaly-tomentose or mealy. Inflorescence of the Glomeratæ. Fruiting perianths not compressed, enclosing the fruit, the orifice small closed by small erect appressed valves.*

Fruiting perianth cylindrical, narrow.
Valves of the fruiting perianth minute, entire, without appendages . . . . 25. *A. leptocarpa.*
Valves 2-horned with a minute central lobe and a dorsal appendage between the horns . . . . 26. *A. limbata.*
Fruiting perianth inflated and spongy.
Fruiting perianth hemispherical or turbinate with an almost flat top and acute or winged margin. Radicle lateral or almost inferior . . . . 27. *A. halimoides.*
Fruiting perianth turbinate-globular, 4 to 6 lines diameter. Radicle superior . . . . 28. *A. holocarpa.*
Fruiting perianth depressed-globular, not 2 lines diameter. Radicle superior . . . . 29. *A. spongiosa.*

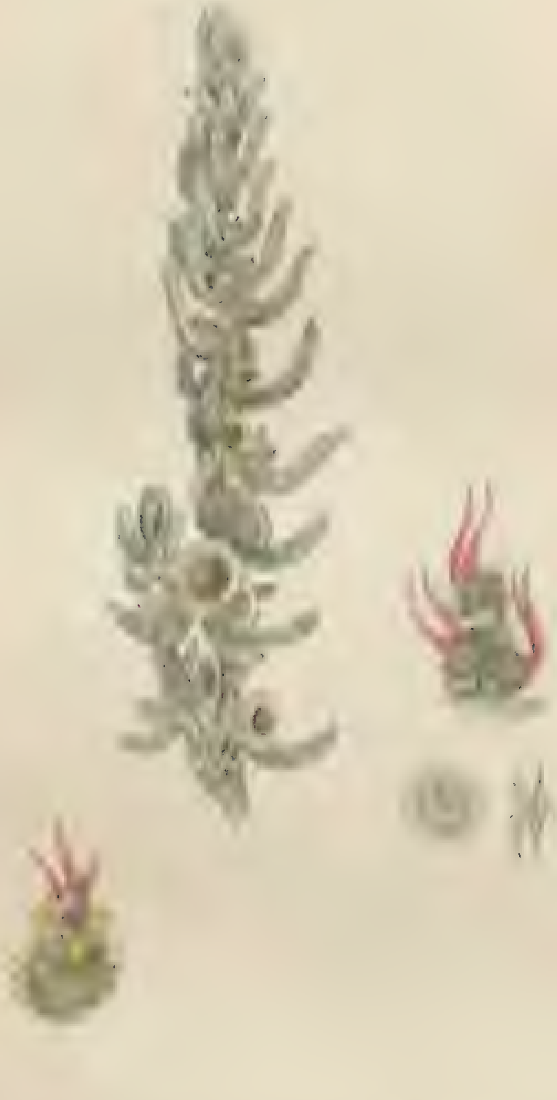
SERIES 6 (or Sect. 2). **Theleophyton.**—*Monœcious prostrate crystalline herb. Flowers axillary. Perianth obovoid with short valves. Seed compressed, at right angles with, not parallel to the valves.*

Single species . . . . 30. *A. Billardieri.*

* *A. hortensis*, Linn. (*Atriplex* sect. *Dichospermum* Moq. in DC. Prod. xiii. ii. 90, 91), an erect green annual of 4 or 5 ft., with large broad leaves, and numerous flowers crowded in a long terminal panicle, the fruiting perianths broad, thin, flat and entire, intermixed with a few small regular 5-cleft perianths with horizontal seeds, a plant of east European or west Asiatic origin, very long cultivated as a vegetable under the name of *Orache*, has been sent from N. S. Wales and from Victoria as an escape from gardens.

SERIES 1. PANICULATÆ.—Diœcious or semidiœcious scaly-tomentose shrubs, the male clusters in more or less branched or paniculate dense or interrupted leafless spikes, the females either also paniculate or spicate or in axillary clusters.

1. **A. stipitata,** *Benth.* An erect bushy rather slender shrub, scaly white or somewhat fulvous all over. Leaves from obovate to



narrow-oblong, very obtuse, entire, contracted into a short petiole, mostly rather thick, ½ to ¾ in. long. Flowers diœcious, the males numerous in little globular clusters scarcely 2 lines diameter, all distinct and somewhat distant, in slightly branched terminal panicles or almost simple spikes; females in smaller clusters, the lower ones often solitary in the axils, the upper ones in a somewhat leafy spike or panicle, some of them sessile ovoid or globular shortly 2-lobed, enclosing an apparently perfect ovary but soon falling off, the greater number more or less stipitate at a very early age with broad flat valves. Fruiting perianth on a slender stipes of 2 to 4 lines, with a small campanulate tube half enclosing the fruit; valves flat, reniform, entire, 4 to 5 lines broad. Seed orbicular, flat, the radicle superior.—*A. reniformis*, F. Muell. Fragm. vii. 9, as to the eastern stations, not of R. Br.

N. S. Wales. Desert of the Darling, *Victorian Expedition, Mrs. Ford;* also in *Leichhardt's* collection.

Victoria. In the N. W. portion of the colony, *L. Morton* (the specimens not in fruit and therefore doubtful).

S. Australia. Murray scrub, *Behr., F. Mueller;* Gawler's range, *Sullivan;* towards Spencer's Gulf, *Warburton.*

2. **A. Moquiniana,** *Webb.; Moq. in DC. Prod.* xiii. ii. 97 (from the character given). A small much-branched scaly-tomentose shrub, with the habit foliage and inflorescence of *A. stipitata* but with a different fruiting perianth. Leaves obovate or broadly oblong, entire, ½ to ¾ in. long. Flowers diœcious, the males in distinct globular clusters usually smaller than in *A. stipitata* but forming similar panicles; females in panicles or spikes leafy at the base as in *A. stipitata*, but I have not observed in them any dimorphism. Fruiting perianth sessile, orbicular-cordate or almost reniform but usually as long as broad, flat with scarcely any tube. Seed orbicular; radicle lateral.—*A. reniformis*, F. Muell. Fragm. vii. 9, as to the Western specimens.

N. Australia. Bay of Rest, N. W. Coast, *A. Cunningham.*

W. Australia. Murchison river, *Oldfield;* Sharks Bay, *Milne;* Abrolhos islands, *Bynoe.*

3. **A. paludosa,** *R. Br. Prod.* 406. An erect spreading or diffuse shrub (or undershrub?) covered with a white or fulvous scaly tomentum. Leaves lanceolate or oblong, usually narrow, obtuse, entire, contracted into a short petiole, ½ to 1 in. long. Flowers diœcious or nearly so, the males in little globular distinct or distant clusters in terminal panicles rarely reduced to interrupted spikes; the female inflorescence more simple and leafy, the lower clusters all axillary. Fruiting perianth on a thick stipes sometimes very short, sometimes above 1 line long, the valves in the typical form broadly ovate-triangular, flat, mostly acute, often toothed towards the base, 2 to 3 lines long and broad, truncate at the base and almost entirely free. Seed enclosed in the valves, with a lateral radicle.—Moq. in DC. Prod. xiii. ii. 102 (partly).

Victoria. In maritime wet sandy places, Port Albert, *F. Mueller.*

Tasmania. Port Dalrymple, *R. Brown.*

W. Australia. King George's Sound, *R. Brown.*

Var. *cordata.* Fruiting perianth nearly orbicular and broadly cordate.—*A. reniformis*, R. Br. Prod. 406; Moq. in DC. Prod. xiii. ii. 101.

S. Australia. Kangaroo Island, *R. Brown*, *Waterhouse;* Port Adelaide, *F. Mueller.*

Var.? *appendiculata.* Fruiting perianth of the shape of that of the var. *cordata*, but longer, at least 5 lines diameter, with a small foliaceous appendage at the base of the disk on one side, showing an approach to the perianth of *A. vesicaria.* N. W. of the head of the Great Bight, *Delisser.* A small fragment in fruit only and the affinity uncertain. There are also in Herb. F. Mueller specimens from various other localities which may belong to *A. paludosa*, but being in leaf only they cannot be determined.

4. **A. Drummondii,** *Moq. in DC. Prod.* xiii. ii. 102. An erect bushy shrub attaining 3 or 4 ft., white or fulvous with a scaly tomentum. Leaves obovate or oblong, obtuse, entire, contracted into a short petiole, mostly ½ to 1 inch long. Flowers diœcious, both sexes in terminal panicles, the male clusters rather small, in numerous short dense spikes; the female panicles rather more leafy at the base with numerous flowers, the fruiting panicles dense. Fruiting perianth flat, broadly ovate-triangular, slightly cordate, 2½ to 3 lines long, the valves free, membranous, entire or slightly toothed at the base. Fruit flat, raised on a small thickened base within the valves. Radicle lateral.—*A. paludosa*, Nees in Pl. Preiss. i. 633, not of R. Br.; *A. paludosa* var. *obovata*, Moq. in DC. Prod. xiii. ii. 102.

W. Australia, *Drummond, n.* 131 (♂) and 135 (♀); Rottenest Island, *Preiss, n.* 1255; Port Gregory, *Oldfield;* Fitzgerald flats, *Maxwell.*

Although allied to *A. paludosa*, this species appears to be sufficiently distinct in foliage and inflorescence and probably in stature, as well as in the quite sessile fruiting perianth. Moquin describes the valves as elliptical, but it is evident that in the specimens he saw, as in all Drummond's, they were not yet fully formed.

5. **A. isatidea,** *Moq. Chenop. Enum.* 63, *and in DC. Prod.* xiii. ii. 101. An erect robust shrub, attaining 16 ft. (*Oldfield*), densely scaly-tomentose. Leaves elliptical obovate or oblong, obtuse, entire or slightly sinuate, contracted into a rather long petiole, thick and soft, 1½ to 3 in. long. Flowers diœcious, both sexes in dense much-branched terminal panicles, the males without the axillary female flowers of *A. cinerea*, the females sometimes with a very few male flowers intermixed. Fruiting perianths with a thick solid turbinate base, the valves semicircular or almost rhomboidal, thick, entire, 3 to 4 lines diameter, shortly united at the base, the disk smooth, tuberculate or muricate with soft appendages; intermixed with these are other perianths not half so large and more orbicular, in which however I have not found perfect seeds. Fruit half-included in the closed base of the perianth, covered by the appressed valves. Radicle superior.—*A. halimus* var. *erecta*, Nees in Pl. Preiss. i. 633 (Moquin).

W. Australia. Swan river, *Drummond, n.* 226 (*or* 223?), *Fraser*, *Preiss, n.* 1259; Murchison river and S. W. Bay, *Oldfield;* Sharks Bay, *Milne;* Abrolhos islands, *Bynoe.*

6. **A. nummularia,** *Lindl. in Mitch. Trop. Austr.* 64. An erect shrub attaining several ft., with spreading branches, the whole plant

covered with a scaly tomentum. Leaves on rather long petioles, mostly orbicular, rather thick, entire or scarcely sinuate-toothed, more rarely bordered by numerous small teeth, ½ to 1 in. diameter, or on some luxuriant branches nearly 2 in. Flowers diœcious, the male clusters forming dense oblong or shortly cylindrical spikes, in more or less branched terminal panicles, either leafless or sparingly leafy at the base, the females also clustered in dense terminal rather more leafy spikes or panicles, with a few flowers also in the axils of the upper stem-leaves. Fruiting perianth sessile, from ovate to orbicular, 2 to 3 lines long, rounded or truncate not cordate at the base, the valves free nearly to the base, thickened and hardened over the fruit at the base, the remainder flat and herbaceous, entire or toothed on each side towards the base. Radicle superior.—Moq. in DC. Prod. xiii. ii. 460.

Queensland. Darling Downs, *Lau.*

N. S. Wales. Macquarrie river, *Mitchell;* Castlereagh river, *Woolls;* Darling river, *Mrs. Ford.*

Victoria. Murray scrub, *F. Mueller, Herrgott.*

S. Australia. In the interior, *Howitt's Expedition*, also *M'Douall Stuart's Expedition.*

Moquin in Herb. Hook. had referred this plant to *A. capensis*, to which it bears some resemblance, but appears to me sufficiently distinct. The *A. halimus*, Br., quoted by Moquin with doubt under *A. capensis* (in DC. Prod. xiii. ii. 100) is *A. cinerea.*

7. **A. cinerea,** *Poir. Dict. Suppl.* i. 471. A branching shrub, sometimes low or slightly decumbent, more frequently erect and attaining several feet, white or ashy grey all over with a scaly tomentum. Leaves oblong or lanceolate, rarely almost ovate, obtuse, entire, contracted into a short petiole, mostly 1 to 2 in. long, but in some specimens scarcely exceeding 1 in. or smaller. Flowers semidiœcious, the males in dense globular clusters of 2 to 4 lines diameter collected into a terminal spike either short and interrupted at the base or 2 or 3 in. long with a few short densely oblong or cylindrical branches, the flowers often not quite sessile in the clusters. Female flowers in axillary clusters on the female plants, and also 1 or 2 female flowers in the axils of the upper stem-leaves of the male plants. Fruiting perianths with an obovoid or turbinate solid base, 1 to nearly 2 lines long, the valves broadly triangular or rhomboidal, from under 3 lines to above 4 lines diameter, free almost from the base, entire, flat or thickened over the fruit, smooth or rarely with 1 or 2 tubercles on the disk. Fruit at the base of the valves. Radicle ascending.—Moq. in DC. Prod. xiii. ii. 101; Hook. f. Fl. Tasm. i. 314; *A. halimus*, R. Br. Prod. 406, not of Linn.; *A. halimus β. ascendens* Nees in Pl. Preiss. i. 633; *A. elæagnoides*, Moq. Enum. Chenop. 65.

Queensland. Moreton Bay, *A. Cunningham.*

N. S. Wales. Botany Bay, *Banks and Solander;* Ash Island, *Herb. F. Mueller;* Lord Howe's Island, *Milne, M'Gillivray.*

Victoria. Seashore, Portland, *Robertson, Allitt;* Port Phillip, Brighton and Station Peak, *F. Mueller.*

Tasmania. Abundant upon all the coasts near high-water mark, *J. D. Hooker.*

S. Australia. Spencer's Gulf, *Warburton;* Kangaroo Island, *F. Mueller, Waterhouse.*

W. Australia. Swan river, *Drummond, n.* 230; Champion Bay and Murchison river, *Oldfield.*

The western specimens are mostly males with rather small leaves, but they can be readily distinguished from the preceding ones by the dense compact male inflorescence and by the female flowers (very minute in most specimens in which the males are scarcely expanded) always present in the axils of the upper stem leaves. *A. hypoleuca*, Nees in Pl. Preiss. i. 633, or *A. prostrata*, Moq. in DC. Prod. xiii. ii. 99, not of R. Br., appears to belong to this species, but the specimens I have seen are not in flower. *A. prostrata*, Br., is a totally different plant.

8. **A. rhagodioides,** *F. Muell. in Trans. Phil. Inst. Vict.* ii. 74. A divaricately branched scaly-tomentose scrubby shrub, closely allied to and perhaps a variety of *A. cinerea.* Leaves shortly petiolate, ovate or lanceolate, often angular or almost hastate at the base, otherwise entire, acute and under ½ in. long when narrow, more obtuse and larger when broad. Flowers semidiœcious, the male clusters forming an interrupted terminal spike or slightly branched panicle, the females solitary or nearly so in the axils of the upper stem-leaves in the male plant, more numerous and often clustered when there are no males. Fruiting perianth sessile, orbicular or nearly rhomboid, 1½ to nearly 3 lines diameter, the valves thick convex and corky, united about half way up, the margins entire. Seed orbicular, with the radicle ascending or nearly superior, but in many perianths the seed is abortive.

Victoria, or **S. Australia.** Murray scrub, *F. Mueller.*
W. Australia. Murchison river, *Oldfield.*

The specimens are insufficient to determine whether this is more than a variety or state of *A. cinerea.* The foliage however is rather different.

9. **A. incrassata,** *F. Muell. Rep. Babb. Exped.* 20. Shrubby. Leaves ovate, hastate, nearly sessile, entire or indistinctly toothed, scaly-tomentose. Male flowers unknown, females clustered in the axils (*F. Mueller*). Fruiting perianth sessile, orbicular, 4 to 5 lines diameter, the valves much thickened with a narrow flat margin, quite smooth outside. Fruit raised to the centre of the perianth on a very broad flattened solid base. Seed not seen ripe.

S. Australia. Emu springs, *Babbage's Expedition.*

This may prove not to be distinct from *A. rhagodioides*, it is however but very imperfectly known, and I have only seen a few detached enlarged but unripe perianths in Herb. F. Mueller.

SERIES 2. VESICARIÆ.—Small bushy or decumbent shrubs, more or less scaly-tomentose, diœcious or monœcious. Male flowers in short dense terminal spikes, females axillary. Fruiting perianth orbicular, membranous, with large membranous appendages on each face.

10. **A. vesicaria,** *Heward, MS.* A bushy shrub, apparently erect, covered with a scaly tomentum. Leaves oblong oblong-lanceolate or rarely almost obovate, obtuse or almost acute, entire, contracted into a short petiole, from under ½ in. to about ¾ in. long. Flowers monœcious (or sometimes diœcious?), the males in small clusters forming rather dense terminal leafless spikes of ½ to 1 in.; females few together

in axillary clusters. Fruiting perianth nearly orbicular, 3 to 5 lines diameter, the valves membranous, very shortly connate, very obtuse or obscurely acuminate, the margins entire, flat but each with a membranous inflated appendage on the disk nearly as large as the valve itself. Seed rather large, compressed; radicle lateral.

Queensland. In the interior, *Mitchell.*

N. S. Wales. Molle's plains, *A. Cunningham:* Murray and Darling desert, *Victorian Expedition, F. Mueller.*

S. Australia. Crystal Brook, *F. Mueller;* Gawler Ranges, *Sullivan* (with more obovate leaves).

11. **A. hymenotheca,** *Moq. in DC. Prod.* xiii. ii. 101. An erect and bushy or procumbent shrub, the branches and foliage minutely scaly but not so white as most species. Leaves lanceolate or oblong, entire, contracted into a petiole, rather thick, ¼ to ½ in. long with smaller ones often clustered in the axils. Flowers diœcious, the male clusters forming cylindrical terminal leafless spikes rarely above ½ in. long, the perianth-segments thicker and darker coloured than in most species, the female flowers axillary, solitary (or 2 or 3 together?). Fruiting perianth nearly orbicular, ¼ to ½ in. diameter, the valves membranous, free almost from the base, the margins entire, flat but each with a large membranous inflated appendage on the disk. Seed not seen ripe.

W. Australia, *Drummond, n.* 128 (♂) *and* 129 (♀). The specimens although numerous are not good, and the fruiting perianths are few, but all leave the membranous appendages of *A. vesicaria*, which appears to have escaped Moquin's attention.

Series 3. Oleraceæ.—Monœcious annuals, usually tall or spreading, green or slightly mealy. Flowers clustered in the axils and in terminal panicles. Valves of the fruiting perianth flat or muricate.

12. **A. patula,** *Linn.; Moq. in DC. Prod.* xiii. ii. 95. An erect spreading or prostrate annual, usually 1 to 2 ft. long, either quite green or somewhat mealy-white, never so thickly scaly as most species. Leaves petiolate, the lower ones usually lanceolate-hastate, coarsely toothed or somewhat lobed, often 3 in. long or more, the upper ones lanceolate and entire. Flowers clustered in slender interrupted spikes forming narrow terminal panicles leafy at the base, the upper floral leaves reduced to small bracts, the female flowers mixed with the males or a few in separate axillary clusters. Fruiting perianths ovate or rhomboidal, usually acute, the valves united to near the middle, entire or toothed, smooth or muricate on the disk, very variable in size and shape but usually under 2 lines diameter. Radicle lateral or ascending. —Hook. f. Fl. Tasm. i. 314; *A. australasica*, Moq. in DC. Prod. xiii. ii. 96.

Queensland. Islands of Moreton Bay, *F. Mueller.*

N. S. Wales. Paterson's river, *R. Brown;* Ash Island, *Herb. F. Mueller.*

Victoria. Abundant in gardens about Melbourne, *Adamson, F. Mueller.*

Tasmania. Abundant in saline marshes near Launceston, *Gunn.*

S. Australia. Holdfast Bay and Gawler ranges, *F. Mueller.*

W. Australia. Port Gregory, *Oldfield.*

The species is very common in Europe and a great part of Asia, including several described as distinct by Moquin, and is probably only of modern introduction in Australia.

SERIES 4. GLOMERATÆ.—Monœcious decumbent procumbent or spreading herbs, scaly-tomentose or mealy-white. Male flowers in globular clusters surrounded by a few females in the upper axils or rarely forming short terminal spikes. Females clustered in the lower axils without males. Fruiting perianths more or less compressed, conspicuously 2-valved.

13. **A. humilis,** *F. Muell. Fragm.* iv. 48. Stems hard and more or less decumbent at the base, ascending to about 1 ft. in our specimens, the branches and foliage mealy or minutely scaly-tomentose. Leaves nearly sessile, mostly lanceolate or oblong-linear, obtuse, entire, contracted at the base, rarely above ½ in. long, but the lower ones not seen. Flowers monœcious, the males in compact sessile terminal spikes of ¼ to ½ in., the females all axillary and densely clustered. Fruiting perianths broadly rhomboid, 1½ to 2½ lines diameter, with a small thick turbinate solid base, the valves entire, free almost to the base, herbaceous and reticulate. Seed orbicular; radicle superior.

N. Australia. Subsaline banks of Flinders river, Gulf of Carpentaria, *F. Mueller.*

14. **A. velutinella,** *F. Muell. Rep. Babb. Exped.* 20. Apparently herbaceous and procumbent, with elongated branching stems, the whole plant scaly-tomentose. Leaves sessile or rarely the lower ones contracted into a short broad petiole, ovate or rhomboid, coarsely sinuate-toothed, mostly above 1 in. long, or the upper ones oblong and nearly entire, much smaller, and passing into small floral bracts. Flowers monœcious, in sessile clusters, the upper ones with numerous males surrounded by several females, either in the uper axils or 2 to 6 of the last clusters forming an interrupted terminal spike; the lower axillary clusters all female. Fruiting perianths flat, triangular ovate, about 3 lines long, the hardened base very short and broad; the valves almost acute, entire or with a few short teeth on each side at the base, herbaceous, scaly-tomentose, free almost to the base. Seed broadly orbicular; the radicle inferior or lateral.

N. S. Wales. Darling Desert, *Victorian Expedition.*
S. Australia. Stuart's Creek, *Babbage's Expedition.*

15. **A. angulata,** *Benth.* Mealy or almost scaly-tomentose and probably herbaceous. Leaves on long petioles which are winged below the lamina, orbicular or broadly rhomboid, very obtuse, angular or sinuate, ¾ to 1½ in. diameter. Flowers monœcious, the male clusters in the upper axils accompanied by a few females or 2 or 3 forming a short terminal spike, the lower axillary clusters small and all female. Fruiting perianth not yet quite ripe, raised on a stipes of about 1 line, with a turbinate compressed tube of a little more than 1 line, and large green toothed valves, 3 lines broad or more. Fruit enclosed in the tube, but raised on a short solid base. Radicle superior.

S. Australia. Subsaline plains near Cudnaka, *F. Mueller;* Murray river, *W. Ross.*

This plant has the foliage almost of *A. nummularia*, but the fruiting perianths cannot be referred to any of those of allied species. I have only seen three small specimens.

16. **A. semibaccata,** *R. Br. Prod.* 406, *not of Moquin.* Stems herbaceous, procumbent or prostrate, much branched and slender, spreading to 1 or 2 ft., the whole plant green and nearly glabrous or mealy-white. Leaves petiolate, oblong oblanceolate or cuneate and ½ to 1 in. long or shorter and obovate, obtuse, entire or sinuate-toothed, rather thin. Flowers monœcious, the males in little globular clusters in the upper axils surrounded by a few females, and a few females alone in the lower axils. Fruiting perianth more or less rhomboidal, 1½ to 2½ lines long, and nearly as broad in the centre, the lower half a flattened triangular tube closed at the base, usually thickened (or fleshy when fresh ?) and prominently 3-nerved, the upper half consisting of the flat appressed triangular valves, entire or toothed at the base, herbaceous at least at the margins. Fruit half-enclosed in the tube. Radicle lateral.—*A. denticulata,* Moq. in DC. Prod. xiii. ii. 97.

Queensland. Keppel Bay, *R. Brown;* Rockhampton, *O'Shanesy;* Darling Downs, *Lau;* Armadilla, *Barton;* Curriwillighie, *Dalton.*

N. S. Wales. Port Jackson, *R. Brown;* Liverpool plains, *A. Cunningham, Leichhardt;* Ballandool river, *Locker.*

Victoria. Murray river, *Herrgott;* Wimmera, *Dallachy* (in leaf only and doubtful); Little river, *Fullagar.*

S. Australia. Holdfast Bay, Gawler river, Port Adelaide, *F. Mueller.*

W. Australia, *Drummond, n.* 222, (*or* 228?).

17. **A. exilifolia,** *F. Muell. Fragm.* vii. 9. A prostrate herb, with a hard almost woody base, but apparently annual, the stems about 1 ft. long, with numerous shortly ascending branches, the whole plant minutely scaly-hoary. Leaves shortly petiolate, obovate orbicular or rhomboidal, the larger ones on the main stems scarcely ¼ in. long, but most of them smaller. Flowers monœcious, in axillary clusters, small and not numerous, the males and females mixed. Fruiting perianths with a short solid turbinate base, broadly deltoid or rhomboid, scarcely above 1 line diameter, the valves flat, entire or 3-toothed.

W. Australia, *Drummond, n.* 249. The habit is that of *A. prostrata,* but on a very much larger scale, and the fruiting perianth much larger and flatter.

18. **A. Muelleri,** *Benth.* An erect or spreading annual of 1 or 2 ft., with a hard base, more or less mealy-white, but not so densely scaly as the shrubby species. Leaves petiolate, broadly obovate ovate or rhomboidal, coarsely and irregularly sinuate-toothed or lobed, mostly from under 1 in. to about 2 in. long and rather thin. Flowers small, monœcious, all axillary, the males in the upper axils in little globular heads surrounded by a few females, the females alone clustered in the lower axils. Fruiting perianths sessile, 1 to 1½ lines diameter, with a hard compressed globular smooth tube, the valves short broad appressed, shortly toothed. Fruit enclosed in the tube. Radicle superior.

Queensland. Peak Downs, *F. Mueller;* Armadilla, *Barton.*

N. S. Wales. Liverpool plains, *Leichhardt.*

Victoria. Lagoons on the Murray, *F. Mueller.*

S. Australia. In the interior, *Howitt's Expedition.*

This is referred by F. Mueller, Fragm. vii. 9, to the European *A. rosea,* but that is a coarser, much more scaly-tomentose species, the fruiting perianth is larger, broader and flatter, the disk reticulate and sometimes muricate, and the radicle of the seed lateral. *A. Muelleri* is, as observed by F. Mueller, allied to *A. semibaccata*, but more mealy and otherwise different both in foliage and fruiting perianth. The true *A. rosea* is said by Moquin in DC. Prod. xiii. ii. 92, to be found in "New Holland," but the special authority is not given, and I have seen no Australian specimen of it.

19. **A. elachophylla,** *F. Muell. Fragm.* vii. 8. A small slender much-branched plant, hard and almost woody, diffuse or procumbent, the specimens not exceeding 6 in., more or less scaly-tomentose. Leaves shortly petiolate, from obovate to oblong or almost lanceolate, obtuse, rather thick, rarely exceeding 2 lines. Flowers monoecious, the males in globular clusters of less than 1 line diameter, sessile within a floral leaf, either terminal or on a short axillary peduncle-like branchlet; the females axillary, solitary or 2 or 3 together. Fruiting perianth rhomboid-globular, but slightly compressed, 1 to 1¼ line diameter, hard, scaly-tomentose, with 2 very short broad green valves, usually toothed on the margin. Fruit enclosed in the tube. Seed compressed; radicle superior.

N. Australia. Desert of Sturt's Creek, *F. Mueller.*

20. **A. microcarpa,** *Benth.* A small diffuse or procumbent herb, with a hard stem and numerous ascending branches not exceeding 6 in. clothed with a scaly tomentum. Leaves very shortly petiolate, oblong or lanceolate, obtuse, entire, under ½ in. long. Flowers very numerous and small, in axillary clusters, a small head of males surrounded by females in the upper axils, all females in the lower ones. Fruiting perianth rhomboidal, compressed, scarcely 1 line long and broad, membranous, densely and softly tomentose, the lower half closed, the upper moiety consisting of 2 entire valves. Radicle of the seed superior.

N. S. Wales. Clay flats, Banaroo (Darling desert), *Victorian Expedition.*

It is possible that this and the following species may prove to be varieties of *A. pumilio*, but at present they appear to me to be quite distinct.

21. **A. prostrata,** *R. Br. Prod.* 406, *not of Moquin.* A prostrate scaly-tomentose annual, with slender much branched leafy stems extending from an inch or two to half a foot or rather more. Leaves very shortly petiolate, oblong or rarely ovate-lanceolate, obtuse, mostly entire, 1 to 2 lines long. Flowers monoecious, the male clusters in the upper axils surrounded by a few females, the females alone several together in the lower axils. Fruiting perianth tomentose, obovoid-rhomboidal, slightly compressed, scarcely ½ line diameter, closed to above the broad middle, the valves short and entire. Seed parallel to the valves; radicle superior.—*A. decumbens*, Roem. and Schult. Syst. vi. 289.

S. Australia. Kangaroo Island, *R. Brown.*

22. **A. pumilio,** *R. Br. Prod.* 406. A small scaly-tomentose herb, with a short hard decumbent stem and numerous branches ascending to 1 or 2 in. Leaves sessile or very shortly petiolate, ovate obovate or oblong, entire or sinuate-toothed, 1 to 1½ lines long. Flowers monoecious, the males in 2 or three little clusters in the upper axils (with

or 2 females ?) scarcely forming very short leafy spikes, the females in the lower axils solitary or two together without males. Fruiting perianth ovate, tomentose, not very flat, about ½ line long, the valves entire or toothed, shorter than the tube. Fruit enclosed in the tube, but bursting it irregularly when ripe. Radicle superior.—Moq. in DC. Prod. xiii. ii. 92.

S. Australia. St. Peter's isles, *R. Brown.*

The testa of the seed is thin, as observed by Brown, but it is of the brown colour of other species, and appears to me to be rather thinly crustaceous than truly membranous.

23. ? **A. glomulifera,** *Nees in Pl. Preiss.* i. 634. A much-branched glabrous erect herb of a finger's length. Leaves oblong or lanceolate-spathulate, obtuse, entire, contracted into a petiole, about 2 lines long, green and fleshy. Flowers (monœcious ?) very minute, the female clusters in almost all the axils, the upper ones about the size of a poppy seed, the lower ones smaller, all very dense, the individual flowers scarcely conspicuous to the naked eye. Fruiting perianth pedicellate, the valves free, longer than the fruit but spreading, obovate nearly orbicular, entire, thin, sprinkled with a few stipitate glands.—Moq. in DC. Prod. xiii. ii. 103.

W. Australia. Cultivated grounds, head of Swan river, Preiss, n. 1257. I have not seen this species. It is said to be probably allied to *A. prostrata* and *A. pumilio*, but the perianth valves ("leaflets of the involucre") are differently described, and the plant is said to be glabrous and green.

24. **A. campanulata,** *Benth.* A perennial, with a hard almost woody stock and rather slender procumbent branching stems extending to 1 or 2 ft., the whole plant nearly glabrous or mealy-white. Leaves shortly petiolate, obovate or oblong, entire or coarsely angular-toothed, mostly under ½ in. or rarely nearly 1 in. long. Flowers monœcious, all axillary, the males forming little globular heads or clusters of little more than 1 line diameter surrounded by several females, or all the flowers female in the lower axils. Fruiting perianth very shortly stipitate, the tube obliquely campanulate, slightly compressed, about 1 line long in front, longer at the back; the limb much dilated, very oblique, the valves unequal and scarcely appressed, each one 3-lobed; with 2 small herbaceous appendages on the front or shorter face of the tube. Fruit enclosed in the tube. Radicle superior.

N. S. Wales. Darling river, *Victorian Expedition.* Included by *F. Mueller* in *A. leptocarpa*, to which it approaches in habit, foliage and inflorescence, but the fruiting perianth is totally different.

Series 5. Parvilobæ.—Monœcious spreading or procumbent herbs or undershrubs, scaly-tomentose or mealy. Flowers axillary, the males in globular clusters in the upper axils usually surrounded by females, females alone often in the lower axils. Fruiting perianths not compressed, enclosing the fruit, the orifice small, closed by small erect appressed valves.

25. **A. leptocarpa,** *F. Muell. in Trans. Phil. Inst. Vict.* ii. 74.—A perennial with a thick stock and herbaceous procumbent stems extending to 1 or 2 ft., the whole plant more or less hoary or white with a scaly tomentum. Leaves obovate or oblong, obtuse, entire when narrow, coarsely angular-toothed when broad, from under 1 in. to nearly 2 in. long. Flowers monoecious, all axillary, the males in little globular dense sessile heads of 1 to 1½ lines diameter, mostly 4-lobed, surrounded by several females or sometimes females only in the lower axils more or less stipitate. Fruiting perianth narrow tubular, cylindrical, 2 to 4 lines long, the lower portion (½ to ⅔) rather hard, enclosing the fruit which is more or less raised on the solid base of the tube, the upper portion above the fruit more herbaceous, green and elegantly veined, the orifice closed by 2 very short triangular entire valves not broader than the tube and without appendages. Radicle ascending or superior.

Queensland. Curriwillighie, *Dalton.*
N. S. Wales, *Leichhardt;* Castlereagh river, *C. Moore.*
S. Australia. Murray river, near Morunda, *F. Mueller.*

26. **A. limbata,** *Benth.* A procumbent or spreading perennial with the habit foliage and inflorescence of *A. leptocarpa*, but more scaly-tomentose. Leaves obovate or oblong, entire or angular-toothed. Flowers monoecious, all axillary, the male clusters in the upper axils surrounded by females, the lower clusters all females. Fruiting perianth with a cylindrical tube enclosing the fruit as in *A. leptocarpa*, but sessile and usually rather larger and harder, and sometimes the solid base much elongated, extending the whole tube to ½ in. or more, but varying in this respect even in the same cluster, the orifice closed by 2 valves reduced to 3 lobes, of which the lateral ones are spreading incurved and hornlike about 1 line long, those of the 2 valves more or less united, the central lobe minute or almost obsolete, and alternating with the horns are 2 herbaceous spreading broad dorsal appendages, also about 1 line long, giving the apex of the perianth the appearance of a spreading 4-lobed limb, but with the disk closed. Radicle of the seed ascending or superior.

N. S. Wales. Darling river, *Victorian Expedition.* Included by F. Mueller in *A. leptocarpa*, but the difference in the fruiting perianth appears to be constant.

27. **A. halimoides,** *Lindl. in Mitch. Three Exped.* i. 285. A procumbent or diffuse perennial or undershrub, with the habit and inflorescence of *A. holocarpa*, but usually not so white and the leaves narrower mostly lanceolate or ovate-lanceolate and acute, but sometimes as tomentose and passing into the small rhomboidal form of that species. Fruiting perianth enlarged to 4 to 6 lines diameter, loosely fibrous and spongy with an inner and an outer membrane as in *A. holocarpa*, but broadly turbinate or almost hemispherical with a much depressed or flattened summit bordered by an annular horizontal wing or acute angle, the very small central orifice closed by small entire or 3-toothed erect valves as in the allied species. Fruit the same, except that the radicle

appears to be always inferior not superior.—*A. Lindleyi*, Moq. in DC. Prod. xiii. ii. 100; *A. inflata*, F. Muell. in Trans. Phil. Inst. Vict. ii. 75.

Queensland. Burnett river, *F. Mueller;* Sutter and Bogan rivers, *Bowman;* Carriwillghie, *Dalton.*

N. S. Wales. Darling desert, *Victorian Expedition, Mrs. Ford.*

Victoria. Wimmera, *Dallachy.*

S. Australia. Murray river and Cudnaka, *F. Mueller;* towards Cooper's Creek, *Howitt's Expedition.*

Moquin changed Lindley's name on account of a previous *A. halimoides* of Tineo, but that has never been otherwise published than as a name in a garden catalogue.

28. **A. holocarpa,** *F. Muell. Rep. Babb. Exped.* 19. A perennial with a hard almost woody base and herbaceous diffuse or procumbent branching stems, attaining from 6 in. to above 1 ft., softly mealy-tomentose. Leaves on rather long petioles, obovate or rhomboidal, irregularly toothed, from under ½ in. to above 1 in. long. Flowers monœcious, all axillary, the males few in the upper axils surrounded by females, females only and usually few together in most axils, very small and globular at the time of flowering. Fruiting perianth obovoid-globular, scarcely compressed, not flattened at the top, 4 to 6 lines diameter, of a loosely fibrous and spongy consistence, with a thin membranous epidermis and a thin inner membrane scarcely distinguishable from the pericarp and sometimes (but not always) hardening over the seed as it ripens; the summit of the perianth with a small central orifice closed by 2 erect appressed, entire or 3-toothed valves, rarely above ½ line long. Seed with the superior radicle of the majority of those species in which it is enclosed in the perianth tube.

N. S. Wales. Murray and Darling desert, *Victorian Expedition, Mrs. Ford* and others.

S. Australia. Eyre's Depot Creek, *Babbage's Expedition;* between Stokes Range and Cooper's Creek, *Wheeler;* towards Spencer's Gulf, *Warburton.*

29. **A. spongiosa,** *F. Muell. in Trans. Vict. Inst.* ii. 74. A small much-branched herb or undershrub, with numerous ascending or erect stems, not above 6 in. high, more or less mealy-white as well as the foliage or becoming glabrous when old. Leaves shortly petiolate, broadly ovate obovate or orbicular, entire or sinuate-toothed, rather thick, ¼ to ½ in. long. Flowers monœcious and axillary as in *A. holocarpa*, but much smaller and fewer together, the females mostly solitary or only 2 in each axil. Fruiting perianth enlarged fibrous and spongy with a membranous epiderm and the inner membrane inseparable from the pericarp as in *A. holocarpa*, but much smaller, depressed globular, not exceeding 2 lines diameter, the small orifice closed by 2 minute erect appressed triangular valves. Seed of *A. holocarpa* with the radicle erect.—*A. semibaccata*, Moq. in DC. Prod. xiii. ii. 97, not of R. Br.

N. Australia. Sturt's Creek, *F. Mueller.*

S. Australia. Lake Torrens, *F. Mueller* (I have not seen these specimens).

W. Australia, *Drummond*, n. 127.

SERIES 7 (or SECT. 2). THELEOPHYTON.—Monœcious prostrate crystalline herb. Flowers axillary. Perianth obovoid with short valves. Seed compressed at right angles with, not parallel to, the valves.

30. **A. Billardieri,** *Hook. f. Fl. N. Zeal.* i. 215, *and Fl. Tasm.* i. 315, *t.* 95. A much-branched prostrate more or less succulent herb, spreading in masses of 1 ft. diameter or more, the branches and foliage covered with watery shining papillæ like those of some *Mesembryanthemæ*. Leaves shortly petiolate, oblong obovate or ovate, obtuse, entire or slightly sinuate-toothed, ¼ to ⅓ in. long. Flowers monœcious, the males in small clusters of about 5 or 6 in the upper axils (without females?) the females in the lower axils solitary or 2 together and very minute. Fruiting perianths obovoid, membranous, scaly, slightly compressed at the base in a direction contrary to the valves, terete upwards, contracted at the orifice, the valves much shorter than the tube, appressed, entire or slightly toothed. Seed enclosed in the perianth-tube, slightly compressed. Embryo placed at right angles to the valves, with the radicle superior but not prominent.—*Obione Billardieri*, Moq. Chenop. Enum. 72; *Theleophyton Billardieri*. Moq. in DC. Prod. xiii. ii. 116; *Atriplex crystallina*, Hook. f. in Hook. Lond. Journ. vi. 279.

Victoria. Sands near high-water mark, Phillip Island and on the opposite coast, *F. Mueller;* E. Gipps' Land, *A. Taylor.*

Tasmania. Sands close to high-water mark near George Town, *Gunn;* South Port, *Oldfield.*

The exceptional direction of the embryo in this single species does not appear of itself sufficient to justify its separation from a genus which, with all the diversities of form assumed by the fruiting perianth, is, as a whole, a remarkably natural and well defined one.

TRIBE 2. CAMPHOROSMEÆ.—Branches continuous. Leaves narrow, entire, flat or terete, glabrous villous-tomentose or woolly. Testa membranous. Embryo curved round a mealy albumen.

5. ENCHYLÆNA, R. Br.

Flowers hermaphrodite. Perianth urceolate, at length depressed-globular, succulent or coriaceous, with 5 short broad lobes or teeth connivent and closing over the fruit, without any dorsal wings or appendages. Stamens 5 or fewer. Ovary depressed-globular. Styles 2 or 3, shortly connate at the base. Fruit depressed-globular, enclosed in the perianth, pericarp membranous. Seed more or less flattened, horizontal; testa membranous; embryo horseshoe-shaped or almost annular, enclosing a very scanty albumen.—Undershrubs or shrubs. Leaves linear-terete or linear-lanceolate, entire. Flowers solitary in the axils and sessile, without any or with one or two minute bracts.

The genus is limited to Australia. It only differs from *Kochia* in the fruiting perianth of a thicker consistence and often succulent, without any dorsal wings or appendages.

Leaves 1 to 2 lines long. Flowers numerous, mostly crowded in terminal leafy spikes. Perianth not above 1 line diameter . . 1. *E. microphylla.*
Leaves mostly above ¼ in long. Flowers distant.
  Fruiting perianth globular, about ¾ line diameter, smooth, hairy at the top. Plant very villous with soft fulvous hairs . . 2. *E. micrantha.*
  Fruiting perianth depressed-globular, about 1½ lines diameter, quite smooth, with very short teeth . . . . 3. *E. tomentosa.*

Fruiting perianth coriaceous, depressed-globular, about 2 lines diameter, the lobes more or less gibbous outside . . . . 4. *E. villosa.*
Fruiting perianth broadly turbinate, very flat, with a nerve-like edge, nearly 2 lines diameter, the tube 10-ribbed . . . . 5. *E. marginata.*

1. **E. microphylla,** *Moq. in DC. Prod.* xiii. ii. 128. A diffuse divaricate (or erect ?) shrub, with numerous slender branches, slightly pubescent. Leaves linear-terete, fine or rather thick, 1 to 2 lines long. Flowers small, solitary in each axil as in the other species, but numerous and crowded into leafy spikes at or near the ends of the branches. Fruiting perianths ¾ to nearly 1 line diameter, shaped like those of *E. tomentosa*, but smaller, thinner (not succulent ?) and slightly angular. Styles usually 2.—*Suæda tamariscina*, Lindl. in Mitch. Trop. Austr. 239; Moq. in DC. Prod. xiii. ii. 461.

Queensland. Near Mount Kilsyth, *Mitchell;* Darling Downs, *Lau.*
N. S. Wales. Foot of Mount Flinders, *A. Cunningham.*

2. **E. ? micrantha,** *Benth.* A shrub, the branches in our specimens above a foot long, with numerous branchlets densely clothed as well as the foliage with soft fulvous silky or sometimes woolly hairs. Leaves rather crowded, linear, soft, 2 to 4 lines long. Flowers very small, solitary in the axils. Perianth, already much enlarged after flowering with the fruit nearly ripe, globular, glabrous or hairy especially the lobes, smooth and rather thick, scarcely ¾ lines diameter; lobes 5, short, obtuse, connivent over the fruit. Stamens 5, shortly exserted, with flattened filaments. Styles 3, connate at the base. Fruit depressed-globular, more or less hairy. Seed not seen quite ripe, but the embryo already large appears to be horizontal, annular, with the radicle prominent and somewhat ascending.

W. Australia, *Drummond 4th coll. n.* 253, referred by F. Mueller, Fragm. vii. 12, with doubt to *Kochia villosa*, but I can see no trace of any wing or transverse prominence to the perianth.

3. **E. tomentosa,** *R. Br. Prod.* 408. A procumbent or divaricately branched undershrub, sometimes with ascending slightly branched stems under 6 in. long, sometimes much branched and attaining several feet, the branches hoary or silvery with a close or woolly tomentum, rarely glabrous or nearly so. Leaves linear-terete, entire, rarely above ½ in. long and sometimes under ¼ in. Flowers all axillary, solitary and sessile and usually distant, with 1 or 2 minute bracts at the base. Perianth small at the time of flowering, 1½ lines diameter when in fruit and then depressed-globular, red and succulent when fresh, black when dry and perfectly smooth, the orifice closed by 5 short connivent teeth quite glabrous or minutely ciliate. Stamens very shortly exserted, the anthers very deciduous. Fruit enclosed in the perianth, the pericarp membranous and glabrous or scarcely hairy in the normal state. Styles usually 3 but sometimes 2.—Moq. in DC. Prod. xiii. ii. 128; Nees in Pl. Preiss. i. 635; *E. paradoxa*, R. Br. Prod. 408; Moq. l.c.; *E. pubescens*, Moq. l.c. (monstrous states, see below).

N. Australia. Sturt's Creek, *F. Mueller.*

Queensland. Burdekin river, *F. Mueller;* Bokhara Creek, *Leichhardt;* Rockhampton, *O'Shanesy;* Suttor river, *Bowman;* Armadilla, *Barton.*
N. S. Wales. Liverpool plains, *A. Cunningham;* Castlereagh river, *C. Moore;* Murray desert and Goyinga mountains, *Victorian Expedition*
Victoria. Murray river, *Herrgott.*
S. Australia. Islands off the S. Coast, *R. Brown;* from the Murray river to St. Vincent's Gulf, *F. Mueller;* Mount Searl, *Warburton;* Cooper's Creek, *Murray.*
W. Australia, *Drummond, n.* 717; Murchison river, *Oldfield;* Sharks Bay, *Gaudichaud;* Avon river, *Preiss, n.* 1935 (Moquin).

Var. *villosa.* Very densely fulvous-villous.—Cudnaka, *F. Mueller.*

Var.? *leptophylla.* Leaves very slender. Perianths very small. Near Gainsford, Queensland, *Bowman.*—Perhaps a distinct species, but the specimens are very small.

Var. *glabra.* Stems and leaves quite glabrous.—Bay of Inlets, *Banks and Solander;* Brisbane river, *F. Mueller;* Darling river, *Victorian Expedition;* between Stokes Range and Cooper's Creek, *Wheeler.*

Besides the woolly globular galls to which this species is liable (like those of *Kochia villosa* and other Chenopodiaceæ), it is subject to a monstrosity, apparently caused also by an insect, by which the pericarp becomes densely enveloped in woolly intricate hairs proceeding from near the base and bursting through the apex of the perianth; whilst the ovary is abortive, and I have sometimes found its place occupied by a small grub. It is this monstrosity in the typical form that is described by Moquin as *E. pubescens,* and in the glabrous variety constitutes the *E. paradoxa,* Br.

4. **E. villosa,** *F. Muell. in Trans. Phil. Inst. Vict.* ii. 76. Stems branching at the base, procumbent or ascending, rarely exceeding 6 in., the whole plant or at least the inflorescence villous, or the lower part or nearly all glabrous. Leaves linear or linear-lanceolate, acute or obtuse, contracted at the base and sometimes petiolate, rather thick, rarely $\frac{1}{2}$ in. and often not $\frac{1}{4}$ in. long. Flowers in the upper axils but not crowded. Fruiting perianth depressed as in *E. tomentosa,* but more angular, about 2 lines diameter, "coriaceous and not succulent," black when dry, shortly hirsute or rarely glabrous, the lobes connivent and closed over the fruit, larger and deeper than in *E. tomentosa;* 2 or 3 outer ones broad and thickened near the apex into 2 obtuse angles or lobes, or one of the outer ones irregular, 2 very rarely 3 inner ones flat and triangular with a thickened transverse line at the base outside. Styles 2 (or rarely 3?). Fruit and seed of *E. tomentosa.*

Queensland. Armadilla, *Barton.*
N. S. Wales. Peel river and near Cassilis, *Leichhardt;* Billabong, *Bissill.*
Victoria. Bacchus Marsh and Station Peak, *F. Mueller;* Little river, *Fullagar.*
S. Australia. Near Adelaide, *F. Mueller.*

This species connects in some measure *Enchylæna* with *Kochia,* for the transverse thickening of the perianth-lobes may be regarded as an incipient wing. The names both of *E. villosa* and *E. tomentosa* are unfortunately selected, as both are sometimes almost if not quite glabrous.

5. **E. marginata,** *Benth.* An undershrub branching at the base, with ascending stems not exceeding 6 in. in our specimens, very villous as well as the young foliage with soft fulvous silky or woolly hairs. Leaves rather crowded, linear, obtuse, soft but flat, often above $\frac{1}{2}$ in. long, very villous at first, becoming nearly glabrous with age. Flowers very small, solitary in the axils. Fruiting perianth sessile, with a flat circular base of nearly 1 line diameter, the tube shortly and broadly

turbinate, thick and apparently fleshy, obtusely 10-ribbed, the summit very flat with a nerve-like margin, 2 lines diameter, the lobes short and quite closed over the fruit. Styles apparently 2, but not seen perfect. Pericarp very flat. Embryo annular.

W. Australia. Swan river, *Drummond*, 1*st coll.* This is again in some measure intermediate between *Enchylæna* and the small flat fruited species of *Kochia*, the nerve-like border (scarcely more than an angle), representing the narrow wing of *K. ciliata* and its allies.

6. KOCHIA, Schrad.

(Maireana, *Moq.;* Sclerochlamys, *F. Muell.*)

Flowers hermaphrodite or polygamous. Perianth at first nearly globular, at length depressed turbinate or pyramidal, not succulent, with 5 rarely 4 short broad lobes connivent and closing over the fruit, imbricate in the bud and 3 outer ones often rather larger than the 2 inner ones, bearing on their backs horizontal wings either distinct or united in a single annular wing surrounding the perianth. Stamens usually 5 or fewer by abortion. Styles 2 or 3, shortly connate at the base. Fruit depressed-globular, enclosed in the perianth; pericarp membranous. Seed more or less flattened, horizontal; testa membranous; embryo horseshoe-shaped or almost annular, enclosing a scanty albumen.—Undershrubs or shrubs, usually procumbent or spreading. Leaves linear or rarely oblong, usually small thick and often semiterete. Flowers solitary or very rarely 2 together in the axils, sessile, with very minute or without any bracts, the perianth very small at the time of flowering with the stamens and styles shortly exserted, but in most species there appear to be many female flowers without any perfect stamens. Fruiting perianth usually described as variously coloured red, from a pale pink to a rich crimson, but no colour remains in the dried specimens.

The genus is limited to the extratropical and subtropical regions of the Old World, the Australian species being apparently all endemic.

Fruiting perianth with an appendage to each sinus, besides the horizontal wings. Leaves softly silky.
  Sinus-appendages linear-spathulate, reflexed below the horizontal wings which are all distinct . . . . 1. *K. lobiflora.*
  Sinus-appendages linear, acute, erect above the horizontal wings which are more or less united in a ring . . . . 2. *K. lanosa.*
Fruiting perianth without sinus-appendages, but with 3 rarely 4 longitudinal wings on the tube below the horizontal ones which are united in a ring . . . . 3. *K. triptera.*
Fruiting perianth without any appendages besides the horizontal wings, which are membranous and entire or irregularly denticulate.
  Horizontal wings all distinct.
    Three outer horizontal wings equal, 2 inner ones smaller. Leaves broad thick and keeled, 1 to 2 lines long. . . . 4. *K. oppositifolia.*
    All 5 horizontal wings equal. Leaves usually narrow, 1 to 2 lines long . . . . 5. *K. brevifolia.*
  Horizontal wings more or less perfectly united in a ring.
    Perianth pyramidal within the wings, projecting about 2 lines . . . . 6. *K. pyramidata.*

Perianth flat within the wings or nearly so.
Leaves mostly ½ in. long, densely silky. Perianths enveloped in long dense woolly hairs . . . . 7. *K. eriantha.*
Leaves mostly ¼ to ½ in. long, linear or terete, tomentose or nearly glabrous (sometimes small and slender), spreading. Perianth glabrous or tomentose . . . . 8. *K. villosa.*
Leaves oblong or oblanceolate, flat, ¼ to ½ in. long. Perianth of *K. villosa* . . . . 9. *K. planifolia.*
Leaves oblong-clavate, almost terete, densely cottony, not exceeding ¼ in. Perianth of *K. villosa* . . . . . . 10. *K. sedifolia.*
Leaves cottony, erect and appressed, rarely exceeding 1 line. Perianth of *K. villosa* . . . . 11. *K. appressa.*
Leaves minute, distant. Branches spinescent. Perianth of *K. villosa* . . . . 12. *K. aphylla.*
Fruiting perianth very flat at the top, surrounded by an annular more or less rigid horizontal border or thick wing, quite entire or regularly toothed.
Annular border of the perianth entire, densely ciliate . . . . 13. *K. ciliata.*
Annular border 5-angled, tube vertically 5-winged . . . . 14. *K. brachyptera.*
Annular border with 10 to 12 radiating points, tube smooth . 15. *K. stelligera.*

1. **K. lobiflora,** *F. Muell. Herb.* A low much-branched undershrub or shrub, our specimens not exceeding 1 ft., the branches and foliage softly and densely silky-tomentose. Leaves sessile, linear, mostly acute, ¼ to nearly ½ in. long, soft and thick but more or less flattened. Flowers solitary in the upper axils. Fruiting perianth woolly-tomentose all over, depressed and about 1½ lines diameter within the wings, the lobes connate over the fruit nearly to the top and quite flat, with 5 separate dorsal wings broadly spathulate contracted into broad stipes and horizontally spreading to a diameter of 5 or 6 lines, and alternating with them there is in each sinus a narrow spathulate reflexed appendage, shorter than the horizontal dorsal wings and concealed under them. Styles usually 2.

N. S. Wales. High sandy banks of the Darling river, *Victorian Expedition.*

2. **K. lanosa,** *Lindl. in Mitch. Trop. Austr.* 88. An erect or spreading undershrub or low shrub, the branches and foliage silky-woolly as in *K. lobiflora.* Leaves sessile, linear, mostly acute, thick and soft, from under ¼ in. to nearly ½ in. long, flowers solitary in the axils. Fruiting perianth more or less woolly all over, depressed and about 1 line diameter within the wings, the lobes obtuse and closed over the fruit, the 5 dorsal wings thin and membranous, all distinct but not stipitate, or more or less connate, spreading to from 4 to 6 lines diameter, with 5 linear acute appendages, alternating with the horizontal wings, erect on their upper side and varying from ½ to 1½ lines in length. Styles 3 or rarely 2.—Moq. in DC. Prod. xiii. ii. 161.

Queensland. Narran river, *Mitchell.*
N. S. Wales. Darling river, *Dallachy, Mrs. Ford.*
S. Australia. Murray desert, near Morunda, *F. Mueller;* towards Cooper's Creek, *Neilson.*

Var. *minor.* Fruiting perianth smaller, the horizontal wings more connate, almost as in *K. villosa,* but with the erect sinus-appendages of *K. lanosa.*

W. Australia. Murchison river, *Oldfield*

The erect appendages have been described as the lobes of the perianth, they will be found, however like the reduced ones of *K. lobiflora*, to alternate with the real lobes, which are flat, obtuse and closely connivent as in most species of the genus.

3. **K. triptera,** *Benth.* A low but stout diffuse or spreading shrub or undershrub, the foliage and often the branches also quite glabrous and somewhat glaucous. Leaves rather crowded, linear, semiterete, often acute, rather thick, ¼ to above ½ in. long. Flowers solitary in the axils. Fruiting perianth with a broadly turbinate tube, above 1 line long below the horizontal wings, with 3 or rarely 4 very prominent vertical wings, and more than half of it occupied by a thick solid base below the fruit, the upper part of the perianth within the wings flat and closing over the fruit as in most *Kochias*, the horizontal wings united in a single rigidly membranous ring expanding to 4 or 5 lines or even ½ in. diameter and quite concealing the vertical wings. Styles usually 3.

N. S. Wales. Darling river, *Victorian Expedition*; Mount Murchison, *Giles.*
W. Australia, *Drummond.*

Var. *erioclada.* Branches densely tomentose, leaves glabrous as in the typical form, but more obtuse and terete.—Murray desert, *Herb. F. Mueller*; W. Australia, *Drummond, n.* 432.

4. **K. oppositifolia,** *F. Muell. in Trans. Vict. Inst.* 1855, 134, *and in Hook. Kew Journ.* viii. 205. A densely branched probably low shrub, more or less hoary or silky-white with a close tomentum. Leaves opposite or alternate, sessile, ovate or lanceolate, rather thick and prominently keeled, about 1 to 1½ lines long. Flowers solitary in the axils. Fruiting perianth much depressed, the tube very short and broad without longitudinal wings, the upper portion flat, with very short teeth closed over the fruit, bordered by three broad membranous veined wings, not connate though expanded into a circle of 3 to 4 lines diameter, with 2 inner smaller wings narrower and less spreading, corresponding to the inner perianth-lobes, and sometimes almost obsolete. Styles 2, connate at the base.

S. Australia. Sea-coast opposite Lake Hamilton, *Wilhelmi*; Coorong desert and Spencer's Gulf, *F. Mueller*; Venus and Streaky Bay, *Babbage.*
W. Australia. King George's Sound, *R. Brown*; towards Cape Riche, *Harvey.* Drummond's specimens, 4th coll. n. 251, without flowers, referred here with doubt by F. Mueller, appear to me to be more like *Didymanthus Roei*, in which the leaves are more constantly opposite and rather longer than in *Kochia oppositifolia.*

5. **K. brevifolia,** *R. Br. Prod.* 409. A much-branched rather slender shrub, the branches and foliage pubescent or tomentose with short woolly hairs or the leaves glabrous. Leaves alternate, sessile, linear or oblong, obtuse, thick and almost terete or somewhat flattened, about 1 line or rarely nearly 2 lines long. Flowers small and solitary in the axils. Fruiting perianth much depressed, glabrous or slightly pubescent, the tube hemispherical, the upper portion scarcely 1 line diameter within the wings, with 5 equal broad obtuse lobes horizontally closed over the fruit but rather thick and almost bullate, forming 5 distinct prominences, the perianth bordered by 5 horizontal mem-

branous veined wings, forming a complete circle of about 3 line diameter but not united as in all the following species. Styles usually 2, rather short, united at the base.—Moq. in DC. Prod. xiii. ii. 131; *Salsola brachyphylla*, Spreng. Syst. i. 924; *Kochia thymifolia*, Lindl. in Mitch. Trop. Austr. 56, Moq. l.c. 461.

Queensland. Darling Downs, *Lau;* Armadilla, *Barton.*

N. S. Wales. Camden valley, Liverpool Plains, *A. Cunningham;* Morra Creek Macquarrie river, *Mitchell;* Darling river, *Mrs. Ford.*

Victoria. Murray desert, *F. Mueller.*

S. Australia. Spencer's Gulf, *R. Brown;* Port Adelaide, *F. Mueller;* Burr Burra, *Hinteracker.*

W. Australia. Murchison river, *Oldfield; Drummond*, 6*th coll. n.* 224.

6. ? **K. pyramidata,** *Benth.* A divaricately branched shrub, with numerous rigid but scarcely spinescent branchlets, softly tomentose-pubescent or cottony as well as the foliage. Leaves alternate, very spreading, linear or terete, obtuse, 1 to 2 lines long, thick and soft, often clustered in the axils. Flowers small, solitary in the upper axils. Perianth about ¾ line long at the time of flowering, more ovoid and more deeply lobed than in other species, the stamens and 2 styles exserted. Fruiting perianth slightly pubescent and drying very black, the tube broadly turbinate the upper portion within the wing erect, pyramidal, at least 2 lines long and as much in diameter at the base, surrounded by an entire annular membranous wing from ½ to 1 line broad. Pericarp and seed as in the rest of the genus.

N. S. Wales. Lachlan river, *A. Cunningham;* sand hills near the Darling, occupying large tracts and giving a character to the country, *Beckler* (*Victorian Expedition*); Murray desert; *Herb. F. Mueller.*

F. Mueller thinks that this may be a state of *K. villosa*, with a monstrously developed perianth, but besides some difference in habit and foliage (which approach those of *K. aphylla*) I find great uniformity in the enlarged perianths which are very numerous on the specimens, and in about half a dozen that I have examined I have always found perfectly normal pericarps, seeds and embryos.

7. **K. eriantha,** *F. Muell. Rep. Babb. Exped.* 20. Apparently a stout shrub, the branches woolly-tomentose. Leaves crowded, sessile, linear or lanceolate, obtuse or acute, thick and soft, densely clothed with silky fulvous hairs, mostly about ½ in. long. Flowers solitary in the axils but crowded along the branches, enveloped in long woolly hairs. Fruiting perianth of *K. villosa*, the horizontal wings connected in a ring spreading to about ½ in. diameter and woolly all over. Styles usually 2.

S. Australia. Elizabeth Creek, *Babbage's Expedition;* between Stokes Ra and Cooper's Creek, *Wheeler.*

This has the foliage of *K. lanosa* and *K. lobopteria*, but still more silky, with the perianth (except in the long woolly hairs) entirely of *K. villosa*, of which it might almost equally well be considered as a variety only.

8. **K. villosa,** *Lindl. in Mitch. Trop. Austr.* 91. An undershrub or shrub, erect spreading or decumbent, more or less silky-villous tomentose or woolly, or the foliage at length nearly glabrous. Leav

alternate, linear, obtuse, thick and soft in the typical form, terete or flattened, from under ¼ in. to about ½ in. long. Flowers solitary in the axils. Fruiting perianth depressed, from quite glabrous except a slight pubescence on the edge of the lobes to tomentose all over including the wings, the tube short and broad without vertical wings, the summit flat within the wings, the lobes very short and closed over the fruit, the dorsal wings united in a single entire or rarely lobed horizontal ring, membranous and very finely veined, spreading to from ¼ to nearly ¾ in. diameter. Styles 2 or 3, usually long, united at the base.—Moq. in DC. Prod. xiii. ii. 461; *Maireana tomentosa*, Moq. in Ann. Sc. Nat. Ser. 2, xv. 97. t. 13; and in DC. Prod. xiii. ii. 130. *Kochia tomentosa*, F. Muell. Rep. Babb. Exped. 20; *K. pubescens*, Moq. in DC. Prod. xiii. ii. 131 as to the Australian but not as to the S. African plant.

N. Australia. Sturt's Creek, *F. Mueller.*

Queensland. Narran river, *Mitchell;* Suttor desert, *F. Mueller.*

N. S. Wales. Lachlan river and Liverpool plains, *A. Cunningham;* Bogan river, *Leichhardt;* from the Murray, Darling and Lachlan rivers to the Barrier Range, *Victorian and other Expeditions.*

Victoria. Murray river, *F. Mueller;* Little river, *Fullagar;* Wimmera, *Dallachy;* Skipton, *Whan.*

S. Australia. St. Vincent's Gulf, *R. Brown* (imperfect specimens referred with doubt to *K. brevifolia*); Flinders' Range and towards Spencer's Gulf, *F. Mueller.*

W. Australia, *Drummond, n.* 125, *4th coll. n.* 242; Sharks Bay, *Milne;* N. W. of the Great Bight, *Delisser.*

The species varies exceedingly in foliage and indumentum as well as in the size of the perianth-wing, which, moreover, although usually quite entire, is sometimes irregularly lobed. The following forms appear the most distinct.

Var. *humilis*, a low undershrub with ascending stems not exceeding 6 in.—Not unfrequent in the desert country of Victoria and adjoining portion of N. S. Wales.

Var. *microcarpa.* Branches very cottony. Leaves small (under ¼ in.), rather thick and nearly glabrous. Fruiting perianth 1½ lines diameter within the wing, 3 lines diameter including the wing.—Darling and Lachlan rivers, *Victorian and other Expeditions.*

Var.? *tenuifolia*, F. Muell. Nearly glabrous. Leaves fine, 2 to 4 lines long. Perianth rather small and late in developing the wing. Perhaps a distinct species.—Darling Downs, *Woolls;* Curriwillighie, *Dalton;* Armadilla, *Barton;* Cooper's Creek, *Murray;* also in *Leichhardt's* collection.

The preceding *K. eriantha*, and the following four species might almost equally well be considered as varieties of *K. villosa*, the lines of demarkation between them being often rather vague.

9. **K. planifolia,** *F. Muell. Fragm.* i. 213. An erect divaricately branched shrub of 2 to 3 ft. (*Oldfield*), the branches and young foliage covered with a soft and dense woolly tomentum which wears off from the older leaves. Leaves oblong or oblanceolate, obtuse, contracted into a distinct petiole, ¼ to ½ in. long rather thick but flat. Fruiting perianth precisely that of *K. villosa*, glabrous or tomentose, the wing generally entire, membranous and attaining 5 to 6 lines diameter.

W. Australia. Murchison river, *Oldfield* (*Herb. F. Mueller*). Perhaps a variety only of *K. villosa.*

10. **K. sedifolia,** *F. Muell. in Trans. Vict. Inst.* 1855, 134, *and in Hook. Kew Journ.* viii. 205. A stout very densely branched shrub at-

taining 2 to 3 ft., white or fulvous all over with a rather close dense cottony wool. Leaves oblong-clavate, obtuse, soft thick and often nearly terete, contracted at the base but sessile, mostly 1½ to 3 lines long. Flowers rather crowded, often two in the same axil. Flowering perianth globular, densely tomentose, not 1 line diameter. Fruiting perianth of *K. villosa*, but the wing usually more regularly circular, glabrous or tomentose, expanding to 3 or 4 lines diameter. Styles usually 3.

N. S. Wales. Lachlan river and Mount Goningberi, *Victorian Expedition*; Darling river, *Mrs. Ford;* Mount Murchison, *Bonney.*
Victoria. Murray river, *Dallachy.*
S. Australia. Murray Scrub, *F. Mueller.*

11. **K. appressa,** *Benth.* A much-branched shrub, more or less clothed with a short but soft cottony wool. Leaves very small, linear or oblong, erect and appressed, rarely exceeding 1 line, thick and soft, imbricate on the young shoots. Flowers solitary in the axils. Fruiting perianth like that of some varieties of *K. villosa*, usually glabrous, the annular wing expanding to about 4 or 5 lines diameter, very thin, with the veins very fine and not very conspicuous.

Victoria? Lake Tyrrell, Murray desert, *Herb. F. Mueller.*
S. Australia. Margaret Creek, *Babbage's Expedition.*

Like the two preceding species, this only differs from *K. villosa* in the foliage.

12. **K. aphylla,** *R. Br. Prod.* 409. A rigid divaricately branched scrubby shrub with rather slender spinescent branches, the whole plant white with a short soft woolly tomentum or becoming at length nearly glabrous. Leaves minute and deciduous, rarely above ½ line long, although on some luxuriant barren branches they may exceed 1 line, the older branches usually glabrous and leafless. Fruiting perianth entirely that of *K. villosa*, of which F. Mueller considers this plant as a variety only. It appears to me however at least as distinct as either of the three preceding ones.—Moq. in DC. Prod. xiii. ii. 131.

Queensland. Armadilla, *Barton.*
N. S. Wales. Darling desert, *Victorian and other Expeditions.*
Victoria. N.W. part of the colony, *L. Morton;* Murray river, *Herrgott.*
S. Australia. Spencer's Gulf, *R. Brown;* Murray Scrub, *Behr.;* Flinders' Range, *Howitt's Expedition;* Gawler Ranges, *Sullivan.*

13. **K. ciliata,** *F. Muell. Rep. Babb. Exped.* 20. Apparently a decumbent undershrub, the ascending branches softly woolly-villous. Leaves alternate, linear or lanceolate, obtuse or acute, silky-villous on both sides, 2 to 3 lines long. Flowers solitary in the axils, but crowded into a terminal leafy raceme. Fruiting perianth very flat, clothed with long soft hairs, scarcely 2 lines diameter including the annular wing, which is thick and hard, quite entire and bordered by a dense fringe of long soft hairs. Styles 2.—*Sclerolæna uniflora*, Lindl. in Mitch. Trop. Austr. 72, not of R. Br.

N. S. Wales. Darling desert, *Dallachy;* Macquarie river, *Mitchell.*
S. Australia. Emu springs and Margaret Creek, *Babbage's Expedition.*

14. **K. brachyptera,** *F. Muell. 2nd Gen. Rep.* 15. A prostrate undershrub, spreading to 1 ft. or more, with shortly ascending branches, clothed as well as the foliage with long soft spreading hairs, not forming the cottony wool of most species. Leaves alternate, linear, sessile, ¼ to ½ in. long, flat and thinner than in most species. Flowers small, solitary in the axils, the perianth ovoid with 5 short erect obtuse membranous lobes. Stamens 5. Styles 2, connate at the base. Fruiting perianth about 1½ lines diameter including the wings, the tube below the horizontal wing hemispherical, shortly hollowed at the base, with 5 vertical wings adnate to the horizontal one and tapering to the base, the summit very flat, bordered by an exceedingly narrow rather thick horizontal 5-angled wing, the angles very acute being the small points of the vertical wings.—*Sclerochlamys brachyptera*, F. Muell. in Trans. Phil. Inst. Vict. ii. 76; *Echinopsilon brachypterus*, F. Muell. Fragm. vii. 13.

N. S. Wales. Lachlan, Murray and Darling rivers, *Victoria and other Expeditions.*

Victoria. Murray river, *Dallachy.*

S. Australia. Cudnaka and Lake Torrens, *F. Mueller*; Cooper's Creek, *Howitt's Expedition.*

15. **K. stelligera,** *F. Muell. Fragm.* vii. 13. A diffuse or procumbent undershrub spreading to 1 ft. or more, with numerous rather slender ascending branches not above 6 in. high, clothed as well as the young foliage with a white cottony wool wearing off from the older leaves. Leaves alternate, sessile, narrow-linear, erect or spreading, very soft, 1 to 3 lines long. Flowers small, solitary in the axils, but often crowded in woolly leafy tufts at the ends of the branches, the perianth nearly globular, woolly outside, with short lobes, about ½ line long. Stamens included. Styles 2, rather long, scarcely united at the base. Fruiting perianth nearly 1½ lines diameter, of a thick hard consistence, the teeth hemispherical, quite smooth, without vertical wings, the basal hollow small, the summit very flat, bordered by a very narrow rather rigid horizontal wing, with 10 to 12 short rigid equally radiating teeth or points.—*Maireana stelligera*, F. Muell. Fragm. i. 139; *Echinopsilon stelligerus*, F. Muell. Fragm. vii. 13.

N. S. Wales. Sandhills and Clay flats, Darling desert, *Victorian Expedition, Dallachy and Goodwin.*

7. CHENOLEA, Thunb.

(Echinopsilon, *Moq.* Eriochiton, *F. Muell.*)

Flowers hermaphrodite or polygamous. Perianth depressed-globular, membranous, with 5 (or 4 ?) inflexed lobes closing over the fruit, and 5 or fewer dorsal divergent spines or soft horn-like appendages, often unequal, sometimes very small or quite obsolete. Stamens 5. Styles 2 or 3, connate at the base. Fruit enclosed in the perianth, more or less depressed. Pericarp membranous. Seed horizontal or oblique; embryo annular, the radicle often ascending over the cotyledonar end.—Diffuse or spreading undershrubs or shrubs. Leaves alternate, narrow, usually soft and silky-villous or woolly, rarely glabrous. Flowers sessile and solitary in the axils, enveloped in cottony wool or long hairs.

The genus is spread over the temperate regions of the Old World, the Australian species apparently all endemic. The allied African and European species require, however, further examination and comparison. The name of *Chenolea* was originally applied to a Cape species, in which the perianth spines are reduced to minute tubercles or are frequently quite inconspicuous and were omitted in Thunberg's description. Moquin, having ascertained their occasional presence, transferred Thunberg's species to his *Echinopsilon*, that is to the section of Brown's *Kochia* with spinescent perianth appendages, and reserved Thunberg's name for a Canary Island plant unknown to Thunberg, in which these tubercles or spines have not yet been detected and perhaps never exist. This development of the spines is, however, so vague in several species that it seems hopeless to distinguish the two genera I have re-united under Thunberg's name, which is the oldest. The spineless species differ from *Enchylæna* chiefly in the texture of the perianth, and in almost the whole genus the seed is not so perfectly flat as in *Enchylæna* and *Kochia*, the radicle being slightly ascending or erect, although not so much so as in *Sclerolæna.*

Fruiting perianth without any appendages, or the spines reduced to minute tubercles. Flowers in terminal leafy spikes.
  Leaves at length glabrous. Fruiting perianths enveloped in long fulvous woolly hairs . . . . 1. *C. carnosa.*
  Leaves hoary-tomentose. Fruiting-perianths enveloped in short dense cottony wool . . . . 2. *C. Dallachyana.*
Fruiting perianth with 3 long radiating soft woolly horns obtuse and turned up at the end . . . . 3. *C. tricornis.*
Fruiting perianth with 5 radiating spines or awns. Perianth without appendages above the spines.
  Perianth with 5 awns or slender spines enveloped in fulvous silky hairs 4 or 5 lines long . . . . 4. *C. eurotioides.*
  Perianth with 5 short radiating spines, enveloped in fulvous hairs not longer than the perianth . . . . 5. *C. Muelleri.*
  Perianth with 5 membranous notched or bifid appendages and 5 radiating spines lower down, enveloped in dense cottony wool . . . . 6. *C. sclerolænoides.*

1. **C. carnosa,** *Benth.* A small undershrub, with a short branching hard base, covered with the remains of old leaves, and erect or ascending flowering stems of 3 or 4 in., slightly cottony or silky-villous or at length glabrous. Leaves sessile, distant in the lower part of the flowering stems, linear, acute or obtuse, rather thick and fleshy, glabrous when full grown, mostly 3 to 4 lines long, the floral ones shorter, lanceolate or ovate-lanceolate, the upper ones not exceeding the flowers. Flowers sessile and solitary in each axil, but crowded into a dense terminal leafy spike of 1 in. or more, and densely enveloped in long intricate silky-woolly hairs, often very shining. Fruiting perianth depressed, membranous, almost scarious, about 1 line diameter without the wool, nearly 3 lines with it, with 5 lobes closing over the fruit and surrounded by a slightly raised horizontal ridge, but without appendages of any sort. Stamens 5. Styles 2 (or sometimes 3 ?) united to the middle. Pericarp depressed, membranous, with a few long hairs. Seed horizontal; embryo broadly annular, with the radicle shortly rising over the cotyledons end.—*Echinopsilon ? carnosus,* Moq. in DC. Prod. xiii. ii. 136; *Trichinium carnosum,* Moq. in Herb. Hook.

W. Australia. *Drummond, 4th coll. n.* 246.

2. **C. Dallachyana,** *Benth.* A shrub or undershrub, the branches clothed with cottony wool. Leaves sessile, linear, obtuse, thick and soft, tomentose but with more appressed and less intricate hairs than the stems, 2 to 3 lines long, the floral ones rather broader and longer, but exceeding the flowers. Flowers solitary or 2 together in the axils, but crowded into terminal leafy spikes of about 1 in. Fruiting perianth (perhaps not quite ripe) nearly globular, membranous, densely woolly-tomentose, about 1½ lines diameter including the wool; lobes broad connivent over the fruit, without any dorsal appendage. Stamens 5. Styles 2, connate at the base. Pericarp depressed, glabrous. Seed horizontal; embryo annular with a shortly ascending radicle.

N. S. Wales or Victoria. Murray river, *Dallachy.*

3. **C. tricornis,** *Benth.* A diffuse or divaricately-branched shrub, densely clothed with a soft white cottony wool. Leaves sessile, linear, rather acute, very soft and densely silky-villous, mostly 3 to 5 lines long. Flowers solitary in the axils of the stem-leaves. Flowering perianth depressed globular, 5-lobed, with 3 obtuse horizontal protuberances. Stamens (always?) 3 only. Styles 3, shortly united at the base. Fruiting perianth depressed, of a thin texture, densely tomentose, slightly hollowed at the base, the lobes horizontally closing over the fruit, with 3 dorsal horizontally radiating soft horns, each fully 2 lines long, obtuse and turned up at the end, the base occupying the whole depth of the perianth-tube. Seed horizontal; embryo nearly annular, the radicle produced beyond the cotyledonar end, but not turned up; albumen very scanty.

N. S. Wales. Clay flats, Darling river, *Dallachy.* This plant at first sight resembles the three-flowered state of *Sclerolæna biflora*, but the three floral rays are the three appendages of one perianth, not three perianths united at the base.

4. **C. eurotioides,** *F. Muell.* An undershrub or perhaps a shrub, with rather slender branches, closely and softly tomentose. Leaves sessile, narrow-linear, acute, very soft and silky-villous, the floral ones similar. Flowers solitary in the upper axils, densely enveloped in long straight silky-fulvous hairs which attain 4 or 5 lines. Perianth already slightly enlarged, about 1 line long, membranous, with 4 obtuse lobes, and 3 or 4 long unequal slender dorsal awns. Ripe fruit not seen, but in the enlarged perianth the seed is oblique, and the embryo already formed with a slightly ascending radicle.—*Echinopsilon eurotioides*, F. Muell. Fragm. vii. 13.

W. Australia, *Drummond, 5th coll. suppl n.* 83.

5. **C. Muelleri,** *Benth.* A shrub or undershrub, with the aspect of some forms of *Sclerolæna dicrantha*, the rather slender branches clothed with a soft tomentum, more silky on the foliage and passing into longer hairs about the inflorescence. Leaves sessile, linear, obtuse or acute, very soft, ¼ to ½ in. long, the floral ones rather shorter and broader. Flowers solitary in the axils, densely enveloped in soft silky hairs of 1 to 2 lines in length. Perianth small, membranous, with (5?) very

short obtuse lobes, and 4 or 5 dorsal awns, which in the fruiting perian become divaricate spines, unequal in length, the longest but little m than 1 line. Stamens 5. Styles 2, united to near the middle. Se horizontal or oblique, with an ascending radicle.

N. Australia. Sturt's Creek, *F. Mueller.*

6. **C. sclerolænoides,** *F. Muell.* A small undershrub, mu branched at the base, usually under 6 in. high, densely clothed with soft rather loose woolly tomentum. Leaves sessile, linear, obtuse, 2 to 3 or rarely 4 lines long. Flowers solitary in the axils, dens involved in woolly hairs forming when in fruit a globular mass of 2 3 lines diameter. Perianth concealed in the wool, with 5 short lobes closing over the fruit, 5 dorsal erect membranous bifid appendag and lower down 5 linear sometimes pungent and spine-like appendag radiating from near the base, all usually concealed under the wool the points of the spines slightly protruding. Styles 2, united at base. Seed horizontal; embryo flat, annular, the radicle either not all or only very slightly rising above the cotyledonar end.—*Erio sclerolænoides,* F. Muell. Second Rep. 15; *Echinopsilon sclerolænoides,* Muell. in Trans. Phil. Inst. Vict. ii. 75.

N. S. Wales. Murray and Darling rivers, *Dallachy and Goodwin,*
Victoria. Murray river at the mouth of the Golgol, *F. Mueller.*
S. Australia. Cudnaka, Lake Torrens, *F. Mueller.*
W. Australia, *Drummond* (*Herb. F. Mueller*).

The *Sclerolæna uniflora,* Lindl. (not of Br.) referred here through some mistake F. Mueller, Fragm. vii. 13, is the *Kochia ciliata.*

8. BABBAGIA, F. Muell.

Flowers hermaphrodite. Perianth urceolate, hard when in fruit, wi 4 (or 5 ?) small membranous lobes, and 2 or 3 dorsal membranous sti tate wings more or less vertical. Stamens 4 (or 5 ?). Styles 2, conn at the base. Fruit enclosed in the perianth. Pericarp membrano Seed horizontal; testa membranous; embryo nearly annular, enclos a mealy albumen, the radicle slightly ascending above the cotyled end.—Diffuse glabrous undershrub or shrub. Leaves linear, altern Flowers solitary in the axils, sessile, without bracts.

The genus is limited to a single species, endemic in Australia.

1. **B. dipterocarpa,** *F. Muell. Rep. Babb. Exped.* 21. A small mu branched diffuse undershrub or spreading shrub, glabrous except so times a slight wool in the axils of the leaves, and more or less glauc Leaves linear or oblanceolate, thick or semiterete, under 3 lines lo often crowded on the young branches. Fruiting perianth rather m than 1 line long, the hollow base about ½ line long and as mu diameter, closed under the fruit, the fruit-bearing part depressed-globul about ¾ line diameter, the broad membranous semicircular wings e panding to about 3 lines diameter, each wing contracted into a th base and placed obliquely or vertically with reference to the perian

apparently by the torsion of that base. Fruit much depressed. Seed very flat.

N. S. Wales. Mount Murchison (*Bonney?*); near Stokes Range, *Wheeler*.
S. Australia. Stuart's Creek and Elizabeth Creek, *Babbage*; Cooper's Creek, *Howitt's Expedition*.

9. DIDYMANTHUS, Endl.

Flowers hermaphrodite. Perianth cylindrical, with 5 short broad thick lobes, closing over the fruit, and bearing on their backs distinct horizontal wings. Stamens 3 to 5. Styles 2, connate at the base. Fruit inclosed in the calyx. Pericarp membranous. Seed ovate, vertical; testa membranous; embryo horseshoe-shaped, almost annular, enclosing a small quantity of mealy albumen; radicle erect.—Shrub or undershrub, more or less cottony. Leaves small, mostly opposite, entire. Flowers two together, sessile in the axils, connate by their base and horizontally divaricate.

The genus is limited to a single species endemic in W. Australia.

1. **D. Roei,** *Endl. Nov. Stirp. Dec. 8, and Iconogr. t.* 100. An erect branching shrub or undershrub, rarely above 1 ft. high, the branches and young leaves more or less hoary or white with close woolly hairs. Leaves mostly opposite or nearly so, sessile, lanceolate, acute, thick, about 2 lines long, silky-villous or nearly glabrous when full-grown. Fruiting perianths divaricate, forming as it were a single cylinder attached by the centre, each perianth varying from 1 to 2 lines in length, with 5 horizontal membranous wings spreading to a diameter of from 1½ to 3 lines. Stamens in the flowers examined usually 3, rarely 4. Styles united to the middle.—Moq. in DC. Prod. xiii. ii. 124.

W. Australia, *Roe*, *Drummond*, *n.* 130, 148, 208. The fruiting perianths vary much in size, although the two of each pair are always similar. At the time of flowering they are very short and almost free from each other.

10. SCLEROLÆNA, R. Br.

(Kentropsis, *Moq.*; Dissocarpus, *F. Muell.*)

Flowers hermaphrodite. Perianth at first nearly globular, at length turbinate or depressed, somewhat compressed, not succulent and usually hard, with 5 short inflexed lobes, and 2 dorsal opposite divergent spines, either both equal or one smaller or scarcely developed. Stamens 5. Styles 2 or rarely 3, connate at the base. Fruit globular or depressed; pericarp membranous. Seed usually globular or depressed at the base, with a more or less prominent ascending or erect rostellum. Testa membranous. Embryo almost annular, surrounding a mealy albumen, the radicle ascending above the cotyledonar end into the rostellum of the seed.—Undershrubs or shrubs, either prostrate decumbent or divaricately branched. Leaves alternate, narrow, usually soft and silky-villous or woolly. Flowers sessile in the axils, enveloped in cottony wool or soft hairs.

The genus is limited to Australia. It is nearly allied to *Anisacantha*, but the spines of the perianth (which I always find dorsal, not terminating the lobes as described by Moquin) are two only, and the seed is not so distinctly vertical.

Flowers solitary in the axils.

Fruiting perianth 1 to 1½ lines long and usually as broad, tomentose or nearly glabrous.

Leaves mostly linear-clavate, thick and obtuse. Spines of the perianth very short . . . . 1. *S. uniflora.*

Leaves narrow-linear, rather acute. Spines 1 to 3 lines long, glabrous or nearly so . . . . 2. *S. diacantha.*

Fruiting perianth 2 lines long, densely covered as well as the spines with long hairs . . . . 3. *S. lanicuspis.*

Fruiting perianth 2 to 3 lines diameter, enveloped in a thick mass of white cottony wool. Spines ¼ to ½ in. long . . . . 4. *S. bicornis.*

Flowers 2 or 3 together united at the base and diverging horizontally . . . . 5. *S. biflora.*

Flowers several together united in a hard globular mass . . . . 6. *S. paradoxa.*

S. coriacea, Moq. in DC. Prod. xiii. ii. 123, from the Barren islands (off the S. coast?) *Herb. Mus. Par.*, is unknown to me, and having no spines to the perianth may not be a true congener. Branches densely woolly, hoary. Leaves imbricate, elliptical or oblong-elliptical, obtuse or rather acute, coriaceous, white and very tomentose, 3 to 4 lines long, 1 to 1½ lines broad. Flowers solitary, tomentose, ¼ line long. Fruiting perianth without spines. Styles much exserted, villous at the base with hispid hairs.

1. **S. uniflora,** *R. Br. Prod.* 410. A diffuse or decumbent much-branched undershrub or shrub, not exceeding 1 ft., covered with a dense hoary or fulvous tomentum. Leaves sessile, linear-clavate, very obtuse, thick and soft, mostly 2 to 4 lines long. Flowers small, solitary in the axils. Perianth oblique, very shortly and irregularly 4- or 5-toothed. Styles 2, connate to the middle. Fruiting perianth scarcely 1½ lines long including the broad hollow base or stipes, hard, tomentose or nearly glabrous, the mouth very oblique, bearing at the top of the tube 1 or 2 opposite very small dorsal spines, sometimes almost obsolete. Embryo horizontally annular at the base, with the radicle turning up over the cotyledonar end and erect.—Moq. in DC. Prod. xiii. ii. 123, partly.

S. Australia. Fowler's Bay, *R. Brown.*

W. Australia. Dirk Hartog's Island, *A. Cunningham;* Sharks Bay, *Milne.*

Moquin has correctly named Cunningham's West Australian specimens in Herb. Hooker, but in giving the station, Liverpool Plains, on Cunningham's authority, in the Prodromus from Herb. DC., he must have had in view some other plant, probably the following species, which may indeed prove to be only a variety of it.

2. **S. diacantha,** *Benth.* A diffuse or prostrate undershrub, densely clothed with a soft fulvous or white tomentum more silky on the foliage. Leaves sessile, linear, mostly acute, very soft, sometimes rather thick and ¼ to ½ in. long, sometimes longer and narrower, the floral ones not broader. Flowers solitary, the perianth broadly campanulate or almost urceolate, about ½ line long and ¾ line broad, the lobes very short membranous and slightly inflexed, the 2 opposite dorsal spines already long and nearly as deep as the perianth-tube. Anthers 5, half exserted.

Styles 2 (or 3?) very shortly connate at the base. Fruiting perianth hard, tomentose, depressed and slightly compressed at the top, about 1 line long, and the flat slightly hollow base 1 to 1½ lines diameter, closed at the orifice, the two opposite dorsal spines diverging or divaricate, nearly equal and varying in the typical form from 1 to nearly 2 lines in length. Seed globular or oblique, with an ascending or erect rostellum. Embryo horizontally annular with an erect radicle.—*Anisacantha diacantha*, Nees in Pl. Preiss. i. 635; *Kentropsis diacantha*, Moq. in DC. Prod. xiii. ii. 138, (both from Moquin's descr.); *Anisacantha kentropsidea*, F. Muell. in Trans. Vict. Inst. 1855, 133, and in Hook. Kew. Journ. viii. 204, reduced to *A. diacantha* in Fragm. vii. 14.

Queensland. Cape river, *Bowman*; Armadilla, *Barton*; Box Forest, *Leichhardt*.
N. S. Wales. Lachlan and Murray rivers, *Herb. F. Mueller*.
Victoria. Bacchus Marsh, *F. Mueller*.
S. Australia. Tumby and Holdfast Bays, *F. Mueller*.
W. Australia. Quangen plains, *Preiss, n.* 2379. I have not seen these specimens, but the descriptions given quite agree with the eastern plant. The Murchison river specimens referred here by F. Mueller, belong however to the nearly allied true *S. uniflora*, Br.

Var. *longispina*.? Perianth rather longer and sometimes narrower, very tomentose or nearly glabrous. Spines slender, 2 to 4 lines long.—Darling desert, *Victorian Expedition*; Murray river, *F. Mueller*; Wimmera, *Dallachy*; Gawler ranges, *Sullivan*; towards Spencer's gulf, *Warburton*.

3. **S. lanicuspis,** *F. Muell.* A low undershrub or shrub, the stems rather stout and not exceeding 6 in. in our specimens, densely clothed with a loose cottony wool, more silky and appressed on the leaves. Leaves rather crowded, linear, thick and soft, often above ½ in. long. Fruiting perianth similar to that of *S. diacantha* but rather larger, 1½ to 2 lines long and very densely clothed with long silky or woolly hairs, the two dorsal opposite spines divergent, nearly equal, 1 to 2 lines long.—*Anisacantha lanicuspis*, F. Muell. Fragm. ii. 170; *Kentropsis eriacantha*, F. Muell. l.c. 140.

N. S. Wales. Darling river to the Barrier Range, *Victorian Expedition*; Ballandool river, *Locker*.

4. **S. bicornis,** *Lindl. in Mitch. Three Exped.* ii. 47. A stout shrub, with divaricate rather thick branches, clothed with a short but soft cottony wool. Leaves very narrow-linear, acute, semiterete, often above ½ in. long, tomentose when young, becoming glabrous when full grown. Flowers solitary in the axils, the perianth 1½ lines long at the time of flowering. Fruiting perianth 2 to 3 lines diameter within the dense white cottony wool which covers it and almost doubles its size, very hard, nearly globular but slightly compressed, with 2 rigid divaricate dorsal spines, varying in length from ¼ to ½ in. or sometimes nearly ¾ in. Seed horizontal, with a long ascending rostellum.—Moq. in DC. Prod. xiii. ii. 123; *Kentropsis lanata*, Moq. Chenop. Enum. 83, and in DC. Prod. xiii. ii. 138; *Anisacantha bicornis*, F. Muell. Fragm. vii. 14.

N. Australia. Sturt's Creek and Plains of Promise, *F. Mueller*.
Queensland. Curriwillighie, *Dalton*.

N. S. Wales. Mollie's Plains, *A. Cunningham;* between the Darling river and the Barrier Range, *Mitchell, Victorian Expedition;* Mount Murchison, *Bonney;* Ballandool river, *Locker.*

S. Australia. Cooper's Creek, *Murray.*

5. **S. biflora,** *R. Br. Prod.* 410. A procumbent or spreading branching shrub, clothed with a short close cottony wool, rather looser and more silky on the foliage of luxuriant shoots. Leaves sessile, narrow-linear, acute or obtuse, very soft, ¼ to ½ in. long. Flowers 2 or rarely 3 together in the axils, connate at the base and divaricate at a very early stage. Perianth at the time of flowering about ¾ line long and broad, deeply divided into 5 lobes inflexed at the end, densely enveloped in cottony wool. Styles 2, connate at the base. Fruiting perianths horizontally diverging from and continuous with a common very broad hollow base or peduncle of about 1 line, the perianths themselves about 1½ lines long, very hard and thick at the base, the orifice nearly closed by the inflexed thinner lobes without any or sometimes with 1 or 2 dorsal minute tubercles or short spines. Pericarp depressed. Seed horizontal or somewhat oblique with an ascending rostellum. Embryo annular with an ascending or erect radicle.—Moq. in DC. Prod. xiii. ii. 123; *Dissocarpus biflorus,* F. Muell. in Trans. Phil. Inst. Vict. ii. 75.

N. S. Wales. Sandhills, Darling river, *Victorian Expedition.*

Victoria. Murray river, *F. Mueller.*

S. Australia. Petrel Bay, *R. Brown.*

6. **S. paradoxa,** *R. Br. Prod.* 410. A decumbent much-branched undershrub, rarely exceeding 1 ft., densely clothed with a loose cottony wool. Leaves sessile, narrow-linear, obtuse, soft and woolly or rarely becoming glabrous with age, from under ¼ to nearly ½ in. long. Flowers in dense axillary clusters, the perianths small, deeply lobed. Styles 2, connate to the middle. Fruiting perianths 10 to 20 together, very hard at the base, connate into a globular cottony or woolly mass of 5 or 6 lines diameter, each perianth with 1 or 2 small dorsal spines shortly protruding from or almost concealed in the wool. Seed nearly globular with a short ascending rostellum; embryo forming a complete circle with the radicle turned upwards over the cotyledonar end.—Moq. in DC. Prod. xiii. ii. 123.

N. S. Wales. Lachlan river, *A. Cunningham* (not yet in flower, and therefore uncertain); *Herb. F. Mueller* (collector not named); Darling river, *Victorian Expedition;* Mount Murchison, *Bonney.*

Victoria. Murray river, *Dallachy.*

S. Australia. St. Vincent's Gulf, *R. Brown;* Murray Scrub, *F. Mueller.*

11. THRELKELDIA, R. Br.

(Osteocarpus, *F. Muell.*)

Flowers hermaphrodite. Perianth urceolate or cylindrical, hard when in fruit, with 4 or 5 short membranous lobes, without any dorsal appendages or in one species with 5 small erect spines. Stamens 5 or fewer. Styles 2 or 3, connate at the base. Fruit enclosed in the perianth.

more or less depressed. Pericarp membranous. Seed horizontal or oblique. Testa membranous; embryo annular or nearly so, surrounding a mealy albumen; radicle ascending or level with the cotyledonar end or descending.—Diffuse procumbent or trailing undershrubs, quite glabrous or in one species scabrous. Leaves narrow, alternate. Flowers solitary in the axils, closely sessile but not obliquely adnate as in *Anisacantha*. Bracts none.

The genus is limited to Australia. It has the hard perianth of *Sclerolæna* and *Anisacantha*, but has either no spines or (in one species) very short erect ones, and differs moreover from the former in the want of any cottony wool, and from the latter in the seed. If, however, slight differences in the perianth and seed are taken into account, the four species here included might be regarded as forming as many genera.

Perianth without appendages or hollow base. Seed with an ascending rostellum.
  Fruiting perianth 1½ lines long, scarcely oblique at the top . . 1. *T. diffusa.*
  Fruiting perianth ¾ line long, very oblique and gibbous on one side at the top . . . . 2. *T. salsuginosa.*
Perianth with a large hollow base below the fruit.
  Perianth 1 to 1½ lines long, with 5 small dorsal erect spines. Seed horizontal . . . . 3. *T. brevicuspis.*
  Perianth 3 to 4 lines long, without spines. Seed very oblique, with a descending radicle . . . . 4. *T. haloragoides.*

1. **T. diffusa,** *R. Br. Prod.* 410. A prostrate diffuse or trailing undershrub, sometimes very small, sometimes extending to 1 or 2 ft., with shortly ascending branches, the whole plant glabrous and somewhat fleshy. Leaves rather crowded, linear, mucronate-acute or obtuse, thick and semiterete, contracted at the base, 2 to 4 lines or rarely ½ in. long. Flowers small, the perianth tubular, ¾ line long, obliquely contracted above the middle, with 4 or 5 broad membranous erect lobes shortly ciliate. Styles 2 or 3, connate to above the middle. Fruiting perianth ovoid, about 1½ lines long, hard and ribbed when dry, said to be fleshy when fresh, the orifice open or half-closed by the withered lobes, without appendages. Fruit enclosed in the perianth and not raised above the base, nearly globular. Embryo horseshoe-shaped or annular and horizontal at the base, with an ascending radicle.—Moq. in DC. Prod. xiii. ii. 127; Nees in Pl. Preiss. i. 635; Hook. f. Fl. Tasm. i. 315.

Victoria. Wilson's Promontory, *F. Mueller.*

Tasmania. Kent's Group, Bass's Straits, *R. Brown*; seashore E. of George Town, *Gunn.*

S. Australia. Holdfast Bay, *F. Mueller.*

W. Australia. King George's Sound, *R. Brown*; Bald Island, *Oldfield*; N. W. of the head of the Great Bight, *Delisser*; Swan river, *Preiss, n.* 1235 (*Moquin*).

Var. *latifolia.* Leaves flatter, broader and more petiolate, but small.—Lucky Bay, *R. Brown*; Dirk Hartog's Island, *Milne.*

2. **T. salsuginosa,** *F. Muell. Fragm.* vii. 12. A prostrate or diffuse undershrub, more slender than *T. diffusa*, and quite glabrous. Leaves narrow-linear, mucronate-acute or obtuse, contracted into a short petiole, under ¼ in long. Flowers very small, the perianth not ½ line long, very oblique, with 4 short thin lobes. Styles 2, shortly united at the base. Fruiting perianth about ¾ line long, nearly globular but

very oblique at the top with an obtuse hollow protuberance on one side, quite smooth even when dry and rather thick and hard. Seed globular at the base with a rostellum ascending into the protuberance of the perianth. Embryo annular at the base with an ascending radicle as in *T. diffusa.*—*Osteocarpum salsuginosum*, F. Muell. 2nd Gen. Rep. 15, and in Trans. Phil. Inst. Vict. ii. 77, also Pl. Vict. Lith. iii. t. 79, according to F. Muell. Fragm. vii. 12 (I have not seen the plate).

Victoria or **N. S. Wales.** Murray river, *F. Mueller, Dallachy.*

3. **T. brevicuspis,** *F. Muell.* A small glabrous undershrub with slender ascending branching stems not above 6 in. in our specimens. Leaves narrow-linear, semiterete, acute, under ½ in. long. Perianth very small and campanulate when in flower. Styles 2, connate to the middle. Fruiting perianth urceolate, about 1½ lines long, hard when dry, with 5 erect nearly equal dorsal spines shorter than the tube and connected by a narrow horizontal ring, constricted under the spines, the whole of the part below the constriction consisting of a hollow base, 10-ribbed outside, closed inside under the fruit, and again closed inside over the fruit, the short membranous lobes erect within the base of the spines. Fruit very flat within the base of the spines. Seed horizontal, with an annular embryo.—*Anisacantha brevicuspis*, F. Muell. Fragm. iv. 150; *Kentropsis brevicuspis*, F. Muell. l. c.

Queensland. Armadilla, *Barton;* Cape River, *Bowman.*

Notwithstanding the spines, this species appears to me to agree better with *Threlkeldia* than with any other genus. The habit is that of *T. diffusa* or of *Anisacantha echinopsila*, differing from the latter in the hollow base of the perianth, in the erect spines, and in the very flat horizontal seed.

4. **T. haloragoides,** *F. Muell. Herb.* Stems elongated, probably procumbent or ascending, much stouter than in the other species and at least 1 to 2 ft. long, more or less scabrous as well as the foliage with scattered asperities, otherwise glabrous. Leaves linear or linear-lanceolate, contracted at the base, flat, rather thick, from about ¼ in. to above ½ in. long. Flowers axillary or somewhat lateral, only seen when already somewhat advanced, narrow tubular and 2 lines long. Fruiting perianth 3 to 4 lines long, thick and very hard, constricted above a short depressed-globular broad hollow base, then cylindrical, with the orifice oblique and open bordered by the shrivelled lobes, closed inside at the constriction below the fruit, and again over the fruit below the top. Seed oblique or nearly vertical. Embryo folded or almost horseshoe-shaped with the radicle descending.

W. Australia, *Drummond, n. 55 and 5th coll. n.* 438.

Notwithstanding the reversed direction of the embryo this species appears to me to be much more closely related to *Threlkeldia* than to any other genus.

12. ANISACANTHA, R. Br.

Flowers hermaphrodite. Perianth urceolate or ovoid, hard when in fruit, obliquely attached at the base, with 4 or 5 short membranous

lobes and 3 to 5 dorsal divergent unequal spines, 1 usually much smaller than the others or reduced to a tubercle. Stamens 5 or fewer. Styles 2 or 3, connate at the base in a column usually persistent and hardened. Fruit enclosed in the perianth, usually ovoid. Pericarp membranous. Seed vertical, somewhat compressed; testa membranous; embryo annular or nearly so, surrounding a mealy albumen, the radicle erect.—Intricately branched shrubs or diffuse undershrubs, glabrous or very rarely villous, especially the young shoots. Leaves linear, alternate, sessile. Flowers solitary in the axils. Fruiting perianths closely sessile and often almost adnate at the base to the stem and to the subtending leaf. Bracts none.

The genus is limited to Australia.

Leaves linear or linear-lanceolate, flat, contracted at the base.
Perianth-spines 5 or 4, one often very small . . . . 1. *A. muricata.*
Leaves small, linear, rather flat, with a broad persistent hardened base. Perianth-spines 3 . . . . 2. *A. Drummondii.*
Leaves linear-terete or semiterete
Perianth-spines 3 rarely 4, one sometimes very small.
Shrubby. Perianth above 1 line long.
Smallest spine above 1 line long . . . . 3. *A. divaricata.*
Smallest spine reduced to a tubercle or rarely nearly 1 line long . . . . 4. *A. bicuspis.*
Small diffuse undershrub. Perianth not exceeding 1 line, the spines short and slender . . . . 5. *A. glabra.*
Perianth-spines 5, short. Small diffuse undershrub. Perianth under 1 line long . . . . 6. *A. echinopsila.*

1. **A. muricata,** *Moq. Chenop. Enum.* 84, *and in DC. Prod.* xiii. ii. 122. A broad bushy or spreading shrub of 2 or 3 ft., with numerous intricate flexuose branches, the typical form quite glabrous and somewhat glaucous, or the young shoots slightly villous. Leaves linear, flat but rather thick, mucronate-acute, contracted at the base, from scarcely above ¼ in. to nearly 1 in. long. Fruiting perianth adnate by a broad oblique base, the hard tube rarely above 1 line long, the membranous lobes short, the dorsal spines 4 or 5, very unequal and spreading, the longest 3 to 6 lines long, the smallest very short, and often the 2 smallest united at the base.—*A. quinquecuspis*, F. Muell. in Trans. Vict. Inst. 1855, 134, and in Hook. Kew Journ. viii. 204.

Queensland. Armadilla, *Barton.*
N. S. Wales. Lachlan river, Liverpool and Molle's plains, *A. Cunningham;* Colroy Creek, *Leichhardt;* Liverpool plains, *C. Moore;* Darling and Murray desert, where the old plants detached by the winds and rolling over the desert plains have received the name of "Roley-poley," *F. Mueller* and others.

Var. *villosa.* The whole plant, at least in young specimens, softly villous.—*A. gracilicuspis*, F. Muell. Fragm. ii. 170.—Mackenzie Downs, *F. Mueller.*

2. **A. Drummondii,** *Benth.* A small much branched shrub, glabrous except a few long spreading hairs on the leaves. Leaves linear, flat but thick, rarely almost terete, not 3 lines long in the only specimen seen, with a broad hard base which persists after the leaf has fallen.

Fruiting perianth glabrous, about ½ line long with 3 slender spreading spines, of which 2 are from 2 to 3 lines long, the third much smaller.

W. Australia, *Drummond* (*Herb. F. Mueller*).

A. divaricata, Moq. in DC. Prod. xiii. ii. 122, described by Moquin from a specimen of Drummond's in De Candolle's herbarium received from Kew Gardens, but certainly not Brown's plant of that name, is most probably the above species. There is now no *Anisacantha* from Drummond in the Kew herbarium, but several Chenopodiaceæ which had been lent from it to Dr. Bunge were unfortunately lost by a shipwreck in the Baltic.

3. **A. divaricata,** *R. Br. Prod.* 410. A diffuse or divaricately branched shrub, glabrous and somewhat glaucous like *A. muricata*, but usually more compact and more densely beset with the prickles of the perianths. Leaves linear-terete, mucronate-acute, often above ½ in. long. Fruiting perianth closely sessile with a broad oblique base, 1 to 1½ lines long, with 3 or 4 very unequal divaricate spines, rather finer than in *A. muricata*, the longest often ½ in. long, but sometimes none above ¼ in., the smallest only 1 to 2 lines, the fourth when present very slender and small; lobes of the perianth usually erect connivent, minutely ciliate.—*A. erinacea*, Moq. in DC. Prod. xiii. ii. 122; *A. tricuspis*, F. Muell. in Trans. Vict. Inst. 1855, 133, and in Hook. Kew Journ. viii. 204.

Queensland. Suttor river, *F. Mueller*, *Bowman;* Bokhara Creek, *Leichhardt;* Darling Downs, *Lau.*

N. S. Wales. Lachlan river and Molle's plains, *A. Cunningham.*

Victoria. Murray river near the Golgel, *F. Mueller.*

S. Australia. Head of Spencer's Gulf, *R. Brown;* Murray river near Morunda, *F. Mueller.*

4. **A. bicuspis,** *F. Muell. in Trans. Vict. Inst.* 1855, 133, *and in Hook. Kew Journ.* viii. 204. A rigid stout but compactly branched shrub or undershrub, the specimens seen not above 6 in. high and quite glabrous. Leaves linear, semiterete, acute, from ¼ in. to above ½ in. long. Flowers closely sessile and semi-adnate as in the preceding species but longer. Fruiting perianth 2 to 3 lines long, the tube ovoid, very hard, with 3 diverging spines, of which 2 (either equal or unequal) varying from ¼ to 1 in. long, the third small, sometimes reduced to a tubercle, sometimes 1 line long; perianth-lobes membranous, obtuse, erect or inflexed. Styles 2, united to above the middle into a hard column. Pericarp usually hardened. Seed obliquely erect with a superior radicle.

S. Australia. Salt plains, Cudnaka, *F. Mueller* (with the perianth about 2 lines long and the longest spines not above ½ in.); between Stokes Range and Cooper's Creek, *Wheeler* (with the perianth fully 3 lines long and the longest species ¾ to 1 in.). Both are single specimens (in Herb. F. Mueller), and may prove to be varieties only of *A. divaricata.*

5. **A. glabra,** *F. Muell. Herb.* A small undershrub, closely resembling *A. echinopsila*, with the same foliage and inflorescence, but the fruiting perianth, although scarcely longer, has a much broader, less oblique base, somewhat compressed at the top, with 2 opposite diverging

very unequal spines, 1½ to 2 lines long, and a third very small one, the perianth thus approaching in form that of *Sclerolæna*, but the seed is vertical or slightly oblique as in *A. echinopsila*.—*Kentropsis glabra*, F. Muell. Fragm. i. 139.

N. Australia. Upper Victoria river and Sturt's Creek, *F. Mueller*.

6. **A. echinopsila,** *F. Muell. Fragm.* vii. 14. A much-branched diffuse or prostrate undershrub, spreading to above 1 ft. diameter, the branches ascending to near 6 in., or sometimes the whole plant not exceeding 2 or 3 in., glabrous and somewhat glaucous, or very rarely the young shoots slightly pubescent. Leaves narrow-linear, semiterete, mucronate-acute or obtuse, mostly about ¼ in., rarely ½ in. long. Flowers very small, closely sessile, with an oblique base. Styles 2, united to the middle into a column hardened at the base. Fruiting perianth hard, scarcely 1 line long, the tube often produced below its insertion into a small protuberance or short spur; lobes 5, short, membranous, with 5 dorsal radiating unequal spines slightly connected in a ring round the summit of the tube, the longest rarely above 1 line long. Seed vertical or slightly oblique, with a superior radicle.—*Echinopsilon anisacanthoides*, F. Muell. in Trans. Phil. Inst. Vict. ii. 76.

Queensland. Desert of the Sutter, *F. Mueller*; Crocodile Creek, *Bowman*; Rockhampton, *O'Shanesy*.

N. S. Wales. Darling desert, *Dallachy*; Ballandool river, *Lorker*.

TRIBE 3. SALICORNIEÆ.—Branches articulate, fleshy. Leaves none. Flowers more or less immersed. Testa various. Embryo curved or folded, with little or no albumen.

13. SALICORNIA, Linn.

(Halocnemum, *Bieb.*; Arthrocnemum, *Moq.*)

Flowers hermaphrodite or polygamous. Perianth thin and membranous or at length thickened and fungous, with 2 to 5 teeth or lobes. Stamens 1 or 2. Styles 2 (rarely 3) united in a column or cone at the base. Fruit enclosed in the unchanged or slightly enlarged perianth. Seed ovoid or nearly globular, often compressed, oblique or vertical. Testa crustaceous or thin. Embryo folded or semicircular, either without albumen or with a small quantity, either lateral or within the curve of the embryo.—Succulent herbs with a hard base or shrubs. Branches articulate, leafless, each article usually concave at the upper end and often dilated into a circular border or into 2 opposite protuberances or lobes (rudiments of opposite leaves) and receiving the next article in the concavity, the articles becoming at length united into a continuous woody stem in the shrubby species; the flowering articles shorter, usually more dilated, forming more or less compact terminal spikes. Flowers usually 3 together, rarely 5 or 7, on each side of each article and more or less immersed in its base, without bracts or bracteoles.

The genus, which with Hooker and others I take in the Linnean sense, including the whole tribe of Salicornieæ as defined by Moquin in DC. Prod., has a wide range over the seacoasts and saline marshes of most parts of the globe, more especially in the Old World. Of the seven Australian species, one extends to New Zealand, another is possibly the same as an Asiatic one, the remaining five appear to be endemic. The species, however, require much further investigation from living plants before the value of the differences in the flowers, which are considerable, can be properly appreciated. A large proportion of the dried specimens before me are not in a state to be satisfactorily examined.

SECT. 1. **Halocnemum.**—*Perianths not dilated at the top, usually narrow. Spikes usually short. Flowers in threes, all or the central one hermaphrodite.*

Spikes ovoid or shortly oblong, with few articles, the margins forming opposite thick triangular-conical lobes.
  Stout shrub. Spikes 5 to 6 lines thick . . . . 1. *S. robusta.*
  Intricately branched shrub. Spikes not 2 lines thick . . . . . 2. *S. arbuscula.*
Spikes oblong-cylindrical, the articles numerous, very short and closely imbricate, the margins dilated into semicircular opposite scarious scales . . . . 3. *S. cinerea.*

SECT. 2 **Arthrocnemum.**—*Perianths at length dilated into a flat transverse or oblique top. Spikes cylindrical, often elongated.*

Flowers in threes, all or the central one hermaphrodite.
  Spikes continuous, the margins of the articles broad obtuse and not prominent. 4. *S. leiostachya.*
  Spikes interrupted by the very prominent 2-lobed margins of the articles . . . . 5. *S. bidens.*
Flowers in threes, unisexual (diœcious?). Articles of the spikes with prominent 2-lobed margins . . . . 6. *S. tenuis.*
Flowers in fives or sevens, mostly hermaphrodite. Articles of the spikes with slightly prominent annular margins . . . . 7. *S. australis.*

Besides the above, I am unable to identify the *Halocnemum australasicum*, Moq. Chenop. Enum. 110, and in DC. Prod. xiii. ii. 149, from King George's Sound, *Herb. Mus. Par.*, which I have not seen. It is certainly not *S. indica*, Br. It is described as having herbaceous ascending stems, with the articles of the branches 2-lobed, those of the spikes broad concave and very obtuse (as in *S. leiostachya?*), but the spikes are said to be very large, conico-cylindrical and 6 to 15 lines long, which does not agree with any of our species. The perianth is described as that of the section *Halocnemum.*

SECT. 1. HALOCNEMUM.—Perianths not dilated at the top, usually hyaline and narrow. Spikes usually short.

1. **S. robusta,** *F. Muell. Fragm.* vi. 251, *and Pl. Vict. t.* 83, *ined.* (*F. Mueller*). Shrubby and much stouter than the other species, the articles ½ to ¾ in. long, with two opposite prominent angles ending in opposite thick triangular lobes or rudimentary leaves projecting to nearly 2 lines. Spikes ovoid or nearly globular, ½ in. diameter, with very thick prominent points of the floral scales or lobes of the floral articles. Flowers in threes, partially immersed and shorter than the subtending scales. Perianths adnate to the article above them at the base, with narrow hyaline lobes, the two lateral perianths 2-lobed enclosing each 1 stamen only, the central one (always?) 3-lobed, enclosing the pistil and 1 stamen. Seed nearly globular; embryo vertical, enclosing a mealy albumen, the radicle ascending beyond the cotyledonar end.—*Arthrocnemum triandrum,* F. Muell. Fragm. i. 139.

N. S. Wales. Salt desert near the junction of the Darling and Murray, *F. Mueller.*
Victoria. Lake Victoria, Murray river, *F. Mueller.*

I have not yet received the plate above referred to.

2. **S. arbuscula,** *R. Br. Prod.* 411. A bushy erect shrub, from under 6 in. to 2 or rarely 3 or 4 ft. high, with numerous rather slender short but intricate branches. Articles often ¼ in. long in the principal branches, 1 to 2 lines in the smaller ones, dilated at the top but without prominent lobes. Spikes terminal, thick, ovoid or oblong, rarely above ¼ in. long but varying much in diameter, consisting of 2 to 6 articles deeply excavated and cup-shaped at the top with more or less prominent lobes or scales. Flowers in threes, all monandrous and hermaphrodite, at first shorter than the scale but at length somewhat exserted, all cohering with each other at the base and immersed in and adnate to the article above them, with short free thin lobes, opening in fruit so that after flowering each ovary appears to be in a separate excavation of the rhachis, with a membranous fringed border. In fruit the lateral ovaries are often abortive, and the central pericarp grows out into a prominent beak (the thickened base of the styles), projecting horizontally considerably beyond the subtending scale.—Hook. f. Fl. Tasm. i. 316; *Arthrocnemum arbuscula*, Moq. Chenop. Enum. 113, and in DC. Prod. xiii. ii. 152; *Arthrocnemum halocnemoides*, Nees in Pl. Preiss. i. 632; Moq. in DC. l.c.

N. Australia? N.W. coast, *Bynoe in herb. Hook.* (possibly some error).

Victoria. Seacoast near Melbourne, *Adamson;* Port Phillip and Point Lonsdale, *F. Mueller;* Wimmera, *Dallachy;* Murray river, *Herrgott;* N.W. part of the colony, *L. Morton.*

Tasmania. Port Dalrymple, *R. Brown;* salt marshes near Hobarton and Clarence Plains, *J. D. Hooker.*

W. Australia. Sand flats N. of Stirling range, *F. Mueller;* Vasse river, *Oldfield;* Swan river, *Drummond, 1st coll.;* Sharks Bay, *Milne* (the two latter sets of specimens very small in all their parts).

3. **S. cinerea,** *F. Muell. Fragm.* vi. 251. Apparently annual, branching at the base, with several single or slightly branched ascending stems of 6 to 8 in., the whole plant of an ashy grey colour when dry. Articles of the branches ¼ to ½ in. long, slightly dilated at the top. Spikes terminal, oblong-cylindrical, rounded at both ends, very compact, ½ to ¾ in. long, 2 to 2½ lines diameter, the articles very numerous, closely imbricate, the margins dilated into opposite semicircular scarious scales, without projecting points but forming projecting acute lines. Flowers in threes, all apparently hermaphrodite and monandrous. Perianths immersed in and adnate to the rhachis at the base, thin and free at the top, very shortly toothed. Seed ovate, erect, but the radicle not always superior.—*Halocnemum cinereum*, F. Muell. Fragm. i. 139.

N. Australia. Point Pearce and Sturt's Creek, *F. Mueller.*

Queensland. Cape York, *M'Gillivray.*

Sect. 2. Arthrocnemum.—Perianths at length dilated into a flat transverse or oblique top. Spikes cylindrical, often elongated, compact or loose.

4. **S. leiostachya,** *Benth.* A spreading much-branched shrub of 2 or 3 ft., the articles of the branches cylindrical, ¼ to ½ in. long, slightly

thickened but not lobed at the top. Spikes numerous, nearly sessile and opposite at the nodes or terminal, cylindrical, compact, ½ to nearly 1 in. long; articles numerous, at first rather distinct with their obtuse margins slightly prominent, but at length very closely packed into an apparently continuous spike of 2 lines diameter, without prominent scales, the separation of the articles only marked by slightly depressed transverse lines. Flowers in threes, wholly immersed and closely packed side by side (not in a triangle as in *S. herbacea*), all hermaphrodite and monandrous, but often only the central one perfecting its seed. Perianths thickened upwards, with a narrow triangular obliquely truncate top. Seed apparently compressed and vertical but not seen very perfect.

N. Australia. Sandflats about Providence Hill and between M'Adam Range and Point Pearce, *F. Mueller;* Kyejeron Creek, Central Australia, *M'Dowall Stuart's Expedition.*

W. Australia, *Drummond,* (*Herb. F. Mueller.*).

5. **S. bidens,** *Benth.* Stems procumbent, hard and apparently woody, with ascending or erect branches, from under 6 in. to above 1 ft. high. Articles mostly under ½ in. long, dilated at the top into 2 opposite lobes with prominent keels to a breadth of 2 lines or rather more; in the older stems the articles are somewhat thickened with the lobes scarcely or not at all prominent. Spikes terminal, at length exceeding 1 in., the articles at first but little more than 1 line long, but growing out to 1½ lines when in fruit, the lobes or scales at their ends very prominent. Flowers in threes, at first almost in a line, more in a triangle when in fruit, all usually hermaphrodite and monandrous. Perianths partially immersed, at first shorter than the subtending scale, when in fruit longer, quite distinct and free from the rhachis, thickened upwards and obliquely truncate and flat at the top. Seed vertical and compressed.—*Arthrocnemum bidens,* Nees in Pl. Preiss. i. 632; Moq. in DC. Prod. xiii. ii. 151.

W. Australia. Salt lagoons N. of Stirling Range, *F. Mueller;* Swan river, *Preiss, n.* 1261; Murchison river, *Oldfield;* Sharks Bay, *Milne.*

This species seems to be closely allied to the E. Indian *S. brachiata,* Roxb., and may possibly prove not to be really distinct from it, but the precise structure of the flowers and seeds requires further investigation in both.

6. **S. tenuis,** *Benth.* A divaricately-branched or diffuse shrub, more slender than the other Australian species. Articles of the branches ¼ to ½ in. long, the upper end dilated into a membranous sometimes scarious margin. Flowers apparently diœcious, both sexes in threes. Male spikes short, but only commencing to flower in the specimens seen, probably at length elongated, the articles larger and broader than in the females, with scarious margins. Perianths all three distinct and slender, with 1 stamen in each, and no trace of pistil. Female spikes slender, 1 to 2 in. long, the articles ½ to above 1 line long. Perianths free, at first almost in a line, at length in a triangle, clavate, turbinate, when in fruit white, much dilated at the top which is obliquely truncate

and flat, each of the three containing a perfect vertical seed, and I have found no trace of any stamen, but the specimens are all past flower.

N. S. Wales. Darling desert, *Victorian Expedition* (♂), and probably the same region, *Mitchell* (♀).

S. Australia. In the interior, *Howitt's Expedition* (♂) and *M'Douall Stuart's Expedition* (♀).

The specimens are very few and I do not feel certain that the male and the fruiting ones are correctly matched. They all differ from the other Australian species in their slender articles with the more or less membranous margins to the upper end.

7. **S. australis,** *Soland. in Forst. Prod.* 88 (*name only*). Stems procumbent, hard, sometimes woody at the base, with ascending or erect branches rarely above 6 in. high, the articles varying from a little more than ¼ to above ½ in. high, not much or not at all dilated at the end and either quite terete or obscurely 2-lobed. Spikes cylindrical, 1 to 2 in. long, usually thicker than the stems, the articles about 1 line long, dilated at the top into slightly prominent rings but not lobed. Flowers 5 or 7 together side by side, all hermaphrodite or the ovaries of the lateral ones abortive, mostly if not all diandrous. Perianths free and distinct, shortly immersed at the base, the central ones rather longer than the lateral, but all shortly prominent beyond the subtending ring, clavate, obliquely truncate and flat at the top and almost closed by the minute connivent teeth.—*S. indica*, R. Br. Prod. 411; Hook. f. Fl. Tasm. i. 317, not of Willd.

Queensland? Fitzroy river, *Thozet* (not in flower).

N. S. Wales? Hastings river, *Beckler*; Clarence river, *Wilcox* (not in flower).

Victoria. Common in wet marshy places on the seashore, Portland, *Robertson*; Port Phillip and Station Peak, *F. Mueller*; salt marshes, Streatham, *Lau*.

Tasmania. Abundant in stony places near the sea and in all salt marshes, *J. D. Hooker*.

S. Australia. Fowler's and Petrel Bays, *R. Brown*.

W. Australia. King George's Sound, *R. Brown*.

The species is common in New Zealand, whence proceeded Forster's original specimen in Herb. Mus. Brit. The true *S. indica* is insufficiently described and pictured by Willdenow (Neu. Schr. Gesellsch. Natur. Fr. Berlin, ii. (not v.) 111, t. 4); but it is probably the same as a species not uncommon on the shores of India and S. Africa, better figured by Wight, Ic. 737, and described by Moquin under the name of *Arthrocnemum indicum*, which has always the flowers in threes, whilst in *S. australis*, besides other differences, they are always in fives or sevens. This species appears to have been unknown to Moquin. His *Halocnemum australasicum*, to which he refers Brown's plant (which he had not seen), must be a very different one. In his diagnosis he omits the character of the 5 to 7 flowers expressly given by Brown.

The northern stations given above must remain doubtful until flowering specimens shall have been observed.

Tribe 4. Salsoleæ.—Branches continuous (not articulate). Leaves narrow, flat, or terete, entire. Testa of the seed various. Embryo spirally coiled, without albumen.

14. SUÆDA, Forsk.

(Chenopodina, *Moq.*)

Flowers mostly hermaphrodite. Perianth depressed-globular, herbaceous or slightly fleshy, with 5 broad lobes connivent over the fruit, without appendages or with a slight horizontal protuberance or thick scale on the back at the base of each lobe. Stamens 5. Styles 2 or 3, rarely more; free or shortly united at the base. Fruit enclosed in the perianth; pericarp membranous, very thin but separable from the seed. Seed flat, horizontal or vertical; testa crustaceous with a thin inner membrane. Embryo flat, spirally twisted, without any or with scarcely any albumen.—Glabrous herbs or undershrubs. Leaves alternate, sessile, linear, thick or terete. Flowers small, sessile, solitary or clustered in the axils. Bracts and bracteoles very small and scarious.

The genus, consisting of a small number of species, is widely diffused over the seacoasts and saline districts of both the New and the Old World, the only Australian species being the most common one over nearly the whole area of the genus.

1. **S. maritima,** *Dumort. Fl. Belg.* 22 (*Moq.*). A much-branched herb, erect and attaining 1 ft. or more, or low and spreading, quite glabrous, somewhat succulent, with a hard almost woody base, but usually annual or biennial. Leaves linear-terete or semi-cylindrical, usually acute, ½ to above 1 in. long. Flowers very small, clustered or rarely solitary in the axils, the fruiting perianth usually about 1 line diameter, with a very flat horizontal seed, but occasionally I have found one perianth in the cluster narrower with a vertical seed. Under each flower there are usually 1 bract and 2 bracteoles, all small transparent scales, but sometimes one of the three is wanting. Seed shining.—Hook. f. Fl. Tasm. i. 316; *Chenopodina maritima*, Moq. in DC. Prod. xiii. ii. 161; *Chenopodium australe*, R. Br. Prod. 407; *Suæda australis*, Moq. in Ann. Sc. Nat. ser. 1, xxiii. 318; *Chenopodina australis*, Moq. in DC. Prod. xiii. ii. 163.

Queensland. Cleveland Bay, *Bowman;* Fitzroy river, *Thozet.*
N. S. Wales. Hunter's river, *Leichhardt;* Ash island, *Woolls.*
Victoria. Glenelg river, Portland Bay, *Robertson* .
Tasmania. Abundant on mud and shingle beaches close to high-water mark, *J. D. Hooker.*
W. Australia. Lucky Bay and Goose Island Bay, *R. Brown;* Cape Naturaliste, *Lay and Collie;* Murchison river, *Oldfield.*

The species is common on the seacoasts of most temperate and subtropical regions both in the New and the Old World. The Australian plant is usually distinguished from the common northern one by its suffrutescent habit, but it is doubtful whether its duration exceeds the second year, which the European plant is said frequently to attain. In both, the base of the stem becomes very hard and more or less woody. I can, no more than J. D. Hooker, detect any other difference between the two.

15. SALSOLA, Linn.

Flowers hermaphrodite. Perianth of 5 rarely 4 distinct segments when in fruit, bearing each on their backs a horizontal wing or protuberance, their points closed over the fruit. Stamens 5 or rarely fewer. Styles 2, rarely 3, united at the base or above the middle. Fruit enclosed in the perianth. Pericarp membranous. Seed depressed or nearly globular, testa membranous; embryo coiled in a conical or doubly convex spire, without albumen.—Herbs or undershrubs usually hard or

fleshy. Leaves narrow-linear or terete, entire. Flowers axillary, sessile, solitary within each floral leaf (or subtending bract), with 2 opposite bracteoles.

The genus is widely spread over the temperate regions of the globe in more or less saline situations. The only Australian species is the most common one over nearly the whole area of the genus.

1. **S. Kali,** *Linn.; Moq. in DC. Prod.* xiii. ii. 187. A hard procumbent or divaricately-branched herb, glabrous or slightly pubescent, usually under 1 ft. but sometimes extending to 2 ft. Leaves alternate or rarely here and there opposite, sessile, hard and rigid in the typical form, the lower ones terete or dilated at the base, from ½ in. to above 2 in. long, the upper ones shorter, thicker, and often more flattened above, but sometimes all terete, the lower floral ones similar to the stem-leaves, the upper ones gradually smaller and sometimes, especially on side branches, reduced to thick triangular or lanceolate bracts not exceeding the calyx, all as well as the bracteoles ending in rigid pungent points. Flowers sessile and solitary in the axil of each bract, but often, owing to the reduction of the flowering branch, clustered in the axils of the primary floral leaves. Bracteoles similar to the floral leaf or subtending bract, but usually smaller. Segments of the fruiting perianth forming at the base a hard or thin campanulate or turbinate tube rarely much above 1 line long, surrounded at the top by the 5 horizontal wings which are either all equal or 2 narrower than the others, each one sometimes 2 lines long and broad, thin and scarious, sometimes very small and thick or in some flowers scarcely perceptible, the summit of each perianth-segment within the wing acute scarious and closing over the fruit. Pericarp with the upper portion flat circumsciss and deciduous. Embryo spiral, the two cotyledons in separate coils one over the other, with the radicle coiled horizontally round the lowest coil or between the two.—*S. australis*, R. Br. Prod. 411; Moq. in DC. Prod. xiii. ii. 188; *S. macrophylla*, R. Br. l.c.; Moq. l.c. 187; Nees in Pl. Preiss. i. 637.

Queensland. Bay of Inlets, *Banks and Solander;* Maria island, *Dallachy;* in the interior, *Mitchell;* Cape and Suttor rivers, *Bowman;* Armadilla, *Barton;* Curriewillighie, *Dalton.*

N. S. Wales. Botany Bay, *Banks and Solander;* Clay flats and saline places from the Murray and Darling to the Barrier Range, *Victorian and other Expeditions.*

Victoria. Lake Hindmarsh, *F. Mueller.*

S. Australia. Petrel Bay, *R. Brown;* St Vincent's and Spencer's Gulfs, *F. Mueller;* between Stokes Range and Cooper's Creek, *Wheeler.*

W. Australia. *Drummond, n.* 244, 245; Swan river, *Preiss, n.* 2396; Murchison river, *Oldfield.*

The species is widely distributed over the temperate regions of the New as well as the Old World in more or less saline districts, extending not unfrequently to within the tropics. I can discover nothing to separate the Australian specimens from the European form even as a variety. Moquin cites both as growing together in Timor.

Var. *leptophylla.* Leaves slender, almost filiform, but pungent when full grown.—Queensland and N. S. Wales.

Var. *strobilifera.* Flowers densely clustered in globular heads with the points of the subtending bracts protruding like the scales of a pine-cone.—Darling desert and Mount Murchison.

Var. *brachypteris.* Wings or appendages of the perianth reduced to prominent transverse ribs, in all or nearly all the flowers.—*S. brachypteris*, Moq. in DC. Prod. xiii. ii. 189.—Rockingham Bay, *Dallachy;* Curtis island, *Thozet.* The size of the perianth-wings is as variable in European as in Australian specimens, and in some flowers of most specimens and in nearly all of other specimens they remain, in both countries, very short or undeveloped as in *S. brachypteris;* in this state *S. Kali* can always be readily distinguished from *S. Soda* by the pungent leaves.

ORDER XCVII. AMARANTACEÆ.

Perianth-segments 5, free or shortly united at the base, rigid and scarious or coloured at least on the margin and tips, imbricate in the bud. Stamens 5 or fewer, opposite the perianth-segments, free or united at the base, with or without intervening scales or teeth (staminodia of some authors); anthers 1- or 2-celled, the cells parallel. Ovary 1-celled, with 1 or several ovules attached to a filiform funicle erect from the base of the cavity. Style simple and entire, with a capitate stigma or more or less divided into 2 or 3 branches or separate styles, stigmatic at the end or along the inner edge. Fruit a membranous indiscent utricle or rarely a circumsciss capsule or a succulent berry, enclosed in or resting on the persistent perianth. Seed usually vertical, orbicular or ovate and compressed, testa crustaceous. Embryo horseshoe-shaped or annular, enclosing a mealy albumen.—Herbs or undershrubs rarely shrubs or woody climbers. Leaves alternate or opposite, entire, without stipules. Flowers rarely solitary in the axils, more frequently in axillary or terminal simple or paniculate spikes or rarely cymes or clusters, each flower sessile or rarely pedicellate, within 2 scarious bracteoles, and subtended by a scarious bract or rarely by a floral leaf.

A considerable Order, spread over the temperate and warmer regions of both the New and the Old World, disappearing in high latitudes and in alpine districts. Of the nine Australian genera, three are widely dispersed over the warmer regions of the globe, each including two or three common tropical weeds, and one of them represented by several species in more temperate districts, a fourth extends over tropical Asia and more sparingly into Africa, another belongs to the tropical American Flora, the remaining four are endemic.

TRIBE 1. **Celosieæ.**—*Anthers 2-celled. Ovary with several ovules. Leaves alternate.*

Woody climbers. Fruit succulent . . . . 1. DEERINGIA.

TRIBE 2. **Achyrantheæ.**—*Anthers 2 celled. Ovary with a single ovule.*

Leaves alternate.
  Stamens shortly united at the base. Flowers axillary, solitary.
    Maritime plants with linear succulent leaves . . . . 2. HEMICHROA.
  Stamens free. Flowers in axillary or terminal and paniculate cymes or clusters. Leaves flat . . . . 3. AMARANTUS.
  Stamens shortly united at the base. Flowers in dense single terminal spikes, often shortened into heads.
    Perianth-segments with the laminæ more or less plumose with dorsal articulate hairs, the tips alone glabrous . . . . . . 4. TRICHINIUM.

Perianth-segments with the whole lamina scarious, coloured and glabrous . . . . 5. PTILOTUS.
Leaves opposite. Stamens united in a cup at the base, with truncate teeth or lobes between the filaments.
Flowers 5-merous, in terminal elongated spikes. Bracts and perianth-segments acute . . . . 6. ACHYRANTHES.
Flowers 4-merous, in axillary or terminal spikes shortened into heads. Bracts and perianth-segments spinescent . . . . 7. NYSSANTHES.

TRIBE 3. **Gomphreneæ.**—*Anthers 1-celled. Ovary with a single ovule. Leaves opposite.*

Stigma capitate. Spikes often shortened into heads, axillary (rarely also terminal) . . . . 8. ALTERNANTHERA.
Stigma 2-lobed. Spikes often shortened into heads, terminal or rarely axillary . . . . 9. GOMPHRENA.

Besides the above, the following species described by F. Mueller cannot be referred to its proper genus until it shall again have been observed. It is evidently not a *Psilotrichum* from its inflorescence. The other species formerly referred by F. Mueller to *Psilotrichum* is now correctly placed in *Trichinium*, from which the following plant differs essentially in its opposite leaves. The teeth of the staminal cup or tube in pairs between each two filaments might, with the opposite leaves, refer it to *Gomphrena*, but from its having been placed in *Psilotrichum* we are led to suppose that the anthers were bilocular.

Psilotrichum capitatum, F. Muell. Fragm. i. 238. A glabrous erect or ascending undershrub of 1 ft. or less. Leaves opposite, ovate or ovate lanceolate, acute, contracted into a petiole, rather thick, ½ to 1 in. long. Flower-heads (spikes?) terminal, sessile, nearly globular. Bracteoles finely pointed, somewhat shorter than the perianth, the bract slightly exceeding the bracteoles. Perianth-segments 3 to 4 lines long, glabrous, the inner ones bearded inside at the base. Filaments capillary, separated by small divaricate teeth in pairs.—Stirling's Creek, *F. Mueller.*—Described by F. Mueller from notes taken at the time of gathering it, the specimens having been lost in the passage home.

TRIBE 1. CELOSIEÆ.—Anthers 2-celled. Ovary with several ovules. Leaves alternate.

1. DEERINGIA, R. Br.

Flowers hermaphrodite or diœcious. Perianth of 5 equal glabrous segments spreading under the fruit. Stamens 5, shortly united in a ring at the base, without intervening staminodia. Anthers 2-celled. Ovary with several ovules. Styles 3, rarely 4, few and stigmatic from the base. Fruit enlarged, succulent, indehiscent. Seeds several.—Tall woody climbers, glabrous or rusty-pubescent. Leaves alternate. Flowers numerous, loosely spicate, the spikes in axillary or terminal panicles. Bracts and bracteoles small, scarious or petal-like.

The genus is widely spread over tropical Asia, more sparingly extending into Africa. Of the two Australian species one is the same as the commonest Asiatic one, the other is endemic.

Quite glabrous. Flowers hermaphrodite . . . . 1. *D. celosioides.*
Branches and young leaves pubescent. Flowers diœcious (the ovaries of the males without ovules) . . . . 2. *D. altissima.*

1. **D. celosioides,** *R. Br. Prod.* 413. A woody glabrous climber scrambling over bushes to the height of 10 or 12 ft. (according to Aus-

tralian collectors). Leaves petiolate, ovate or ovate-lanceolate, acuminate, entire, mostly 2 to 3 in. long. Flowers hermaphrodite, solitary or somewhat clustered, in slender interrupted spikes varying from 2 or 3 to 8 or 10 in. long, either in the upper axils or in a loose terminal panicle, each flower nearly sessile in the axil of a small linear-lanceolate acute bract, shorter than the perianth except sometimes in the lower part of the spike, and accompanied by two smaller bracteoles. Perianth-segments ovate, scarcely 1 line long, of a greenish white when fresh, black with a whitish margin when dry. Stamens united at the base in a prominent ring or very short cup. Berry red, nearly globular, 3-furrowed, usually about 2 lines diameter or rather larger.—Bot. Mag. t. 2717; Endl. Iconogr. t. 62; Wight Ic. Pl. t. 728; *D. baccata*, Moq. in DC. Prod. xiii. ii. 236.

Queensland. Shoalwater and Keppel Bays and Broad Sound, *R. Brown*; Endeavour river, *A. Cunningham*; Barnard Isles, *M'Gillivray*; Port Denison, *Fitzalan*; Rockingham Bay, *Dallachy*; Rockhampton, *Dallachy* and others, Darling Downs, *Lau*; Brisbane river, Moreton Bay, *F. Mueller* and others.

N. S. Wales. Port Jackson, *R. Brown*, *Woolls*; northward to Macleay, Hastings, and Clarence rivers, *Beckler*; New England, *C. Stuart*; southward to Kiama, *Harvey*.

The species is common in E. India and the Archipelago, extending to New Caledonia.

2. **D. altissima,** *F. Muell. Fragm.* ii. 92, vi. 251. A woody climber resembling *D. celosioides* but larger, ascending to the tops of the tallest trees, the young parts clothed with a soft rusty crisped pubescence which disappears from the upper surface of the older leaves, persisting underneath or at least leaving some traces along the midrib. Leaves ovate or oblong, rarely ovate-lanceolate, very shortly acuminate, thicker than in *D. celosioides*, and attaining 3 to 6 in. Flowers diœcious, more numerous than in *D. celosioides*, in denser spikes and larger panicles, the males much whiter and more petaloid than in that species, the stamens united in a scarcely prominent ring, the ovary ovoid and conical externally perfect as well as the styles but without any ovules; the female flowers smaller, not so white, in more compact and less branched panicles, the ovary more globular with about 10 to 15 ovules, the stamens more or less imperfect or altogether abortive. Berry globular, red, scarcely 1½ lines diameter.—*Lagrezia altissima*, Moq. in DC. Prod. xiii. ii. 253; *Lestibudesia arborescens*, R. Br. Prod. 414; *Celosia arborescens*, Spreng. Syst. i. 815; Moq. in DC. Prod. xiii. ii. 243.

Queensland. Endeavour river, *Banks and Solander*; Port Denison, *Fitzalan*; Rockingham and Edgecombe Bays, *Dallachy*; Brisbane river, Moreton Bay, *A. Cunningham* and others; Port Mackay, *Nernst*.

N. S. Wales. Hastings river, *Beckler*; Richmond river, *Henderson*; Tweed and Clarence rivers, *C. Moore*.

The male specimens being the handsomest are the most frequently collected and the only ones seen by R. Brown and by Moquin. The ovary in them is so large that it has not the appearance of being abortive, but I have opened a large number without ever finding any ovules. From its membranous appearance Brown thought the fruit might be capsular, and Moquin that it might be monospermous, which accounts for their not having associated the plant with *Deeringia*.

TRIBE 2. ACHYRANTHEÆ.—Anthers 2-celled. Ovary with a single ovule. Leaves alternate or opposite.

2. HEMICHROA, R. Br.

Flowers hermaphrodite. Perianth-segments 5, free, erect, glabrous, rigid, white at least inside. Stamens 5 or fewer, the filaments united in a short cup at the base, without intervening teeth or scales. Ovary uniovulate. Style with 2 very short or rather long stigmatic branches. Fruit an indehiscent utricle. Seed vertical.—Maritime prostrate herbs or low spreading shrubs. Leaves alternate, linear, fleshy. Flowers sessile and solitary in the axils, between 2 rigid scarious bracteoles.

The genus is limited to Australia, but is scarcely distinct from the European and Asiatic genus *Polycnemum*, differing indeed only in the thick succulent leaves and longer style.

Prostrate herb. Stamens 5. Style bifid . . . . 1. *H. pentandra.*
Small divaricate shrub. Stamens 2, unilateral. Style with a very short bifid stigma . . . . 2. *H. diandra.*

1. **H. pentandra,** *R. Br. Prod.* 409. A glabrous perennial, with prostrate stems and numerous shortly ascending branches, forming dense patches of ½ to 1 ft. diameter. Leaves sessile, linear, mucronate, thick or semiterete and succulent, ¼ to ¾ in. long, the upper floral ones somewhat dilated and concave at the base, but otherwise similar to the others. Bracteoles ovate, acute, scarious with a prominent midrib, from ½ to ¾ the length of the perianth. Perianth about 1½ lines long, the segments acute, more or less scarious and coloured (white ?) inside, the outer ones almost ovate and 3-nerved, the inner ones narrower, more lanceolate, 1- or 2-nerved. Stamens 5, much shorter than the perianth, united at the base in a short annular cup. Style in the flowers examined divided to the middle or lower down, but described by others as very shortly lobed. Fruit ovoid, shorter than the perianth, not oblique; pericarp rather thickly membranous. Seed with a crustaceous shining testa. Embryo semiannular according to Moquin, forming almost a complete ring in the seeds examined.—Moq. in DC. Prod. xiii. ii. 334; Hook. f. Fl. Tasm. i. 311.

Victoria. In rather muddy places on the seashore from Gipps Land to the western frontier, *F. Mueller.*

Tasmania. On the shore, Port Dalrymple, *R. Brown;* Great Swan Port, *Backhouse;* George Town, *Gunn.*

S. Australia. Port Adelaide, *F. Mueller.*

W. Australia. King George's Sound, *R. Brown.*

2. **H. diandra,** *R. Br. Prod.* 409. A small glabrous much-branched spreading plant, evidently shrubby and apparently less prostrate than *H. pentandra.* Leaves linear and succulent as in that species but not so thick and the floral ones more dilated at the base. Flowers rather larger and more scarious. Perianth about 2 lines long, and the bracteoles not much shorter, segments rather obtuse, 1-nerved, the inner ones not

much narrower than the outer. Stamens 2, not much shorter than the perianth, the filaments much dilated below the middle, and united at the base on the gibbous side of the ovary, the staminal cup interrupted on the other side, without any rudimentary stamens. Ovary very gibbous on the side next the stamens. Style undivided, with a small 2-lobed stigma. Fruit not seen ripe.—Moq. in DC. Prod. xiii. ii. 334.

N. Australia? A fragment from Nichol Bay, N.W. coast, in herb. F. Muell., appears to belong rather to this species than to *H. pentandra*, but is insufficient for determination.

S. Australia. Fowler's Bay, *R. Brown*; hills near Lake Hamilton, *Wilhelmi*; head of Spencer's Gulf, *F. Mueller*, *Warburton*.

W. Australia. Salt marshes, Sharks Bay, *Milne*.

3. AMARANTUS, Linn.

(Sarratia, *Moq.*; Amblogyne *and* Euxolus, *Rafin.*)

Flowers usually monœcious. Perianth-segments 3 to 5, erect with scarious margins or (especially when in fruit) more or less dilated at the end into spreading scarious laminæ. Stamens 3 to 5, free, without intervening staminodia. Anthers 2-celled. Ovary uniovulate. Styles 2 or 3, free and stigmatic from the base. Fruit a membranous utricle, either circumsciss when ripe or indehiscent with the pericarp loose or adnate to the seed. Seed solitary.—Herbs mostly annual, glabrous or nearly so, green or red. Leaves alternate. Flowers small, in dense cymes or clusters, the clusters all axillary or collected in terminal spikes which are either simple or branching into dense panicles. Bracts and bracteoles small, green or scarious. The female flowers are usually much more numerous than the males, which are in the same clusters, chiefly in the upper parts of the inflorescence, with the same number or with fewer perianth-segments than the females.

The genus has a very extensive range over the New and the Old World, some of the larger species much cultivated for the seed and several others very common weeds of cultivation. Of the ten species here enumerated one is evidently an escape from cultivation, two others are common weeds of cultivation, one chiefly in the Old World, the other in the warmer regions of both the New and the Old World. The remaining seven are endemic, but two of them bear a remarkable resemblance to the West Indian and Central American group of *Amblogyne*.

The characters derived from the dehiscent or indehiscent pericarp or from the more or less spreading laminæ of the fruiting perianth, are so little in accord with habit or with any other character, that I have thought it better to retain the collective genus as a natural and very fairly defined one, than to adopt the purely artificial disseverances proposed by Moquin and others.

SECT. 1. **Euamarantus.**—*Pericarp circumsciss.*

Perianth-segments mostly 5, erect. Tall erect plant with an ample panicle, the points of the bracts very prominent . . . 1. *A. paniculatus.*
Perianth-segments mostly 3, erect or slightly dilated at the end. Clusters all axillary or the upper ones in a short dense terminal spike . . . . 2. *A. Blitum.*
Perianth-segments mostly 4 or 5, erect or slightly dilated at the end. Clusters axillary and in a long loose terminal shortly-branched spike . . . . 3. *A. leptostachyus.*
Perianth-segments mostly 5, with dilated scarious spreading laminæ (when in fruit). Terminal spikes usually paniculate . 4. *A. pallidiflorus.*

SECT. 2. **Euxolus.**—*Pericarp membranous, indehiscent or bursting irregularly.*

Pericarp separate from the seed, shorter than or not much longer than the perianth.
Segments of the fruiting perianth 5, with dilated and scarious laminæ. Cymes axillary. Pericarp longitudinally ribbed . 5. *A. Mitchellii.*
Segments of the fruiting perianth erect or slightly dilated and spreading. Clusters axillary and in a terminal spike.
Fruiting perianths mostly 5-merous . . . . 6. *A. interruptus.*
Fruiting perianths mostly 3-merous . . . . 7. *A. viridis.*
Pericarp separate from the seed, oblong, at least twice as long as the perianth. Clusters all axillary . . . . 8. *A. macrocarpus.*
Pericarp small, globular, very thin and not readily separable from the seed. Leaves narrow. Clusters all axillary. Perianth-segments mostly 4.
Perianth-segments twice as long as the fruit . . . . 9. *A. tenuis.*
Perianth-segments about as long as the fruit . . . . 10. *A. enervis.*

SECT. 1. EUAMARANTUS.—Pericarp circumsciss when ripe, the lower half with the perianth usually (but not always) remaining attached after the seed has fallen. Male perianths usually of as many segments as the females.

1. **A. paniculatus,** *Linn.; Moq. in DC. Prod.* xiii. ii. 257. An erect stout annual sometimes attaining 5 or 6 ft., the foliage and inflorescence often assuming a reddish hue and sometimes the panicle a rich crimson. Leaves on long petioles, ovate or ovate-lanceolate, 2 to 4 in. long. Flowers in dense cylindrical spikes, the lower ones axillary, the upper ones forming a dense terminal panicle, 6 in. to 1 ft. long, the central spike thicker and longer than the lateral ones, all appearing more or less echinate by the fine points of the bracts and bracteoles which usually exceed the perianth. Perianth-segments mostly 5, erect, tapering into a fine point, 1 to $1\frac{1}{4}$ line long. Pericarp membranous, rugose, circumsciss. Styles 2 or 3.—*A. frumentaceus*, Roxb. Fl. Ind. iii. 699; Wight, Ic. t. 720.

N. S. Wales. Port Jackson, *R. Brown;* Clarence river, *Beckler.*

Evidently an escape from cultivation as suggested by R. Brown, and therefore omitted from his Prodromus. Extensively cultivated in India, and probably a native of Asia.

There is also a single specimen from Darling Downs, *Lau*, in Herb. F. Mueller, of what appears to be *A. caudatus*, Linn., another cultivated species, nearly allied to the last, but usually with a longer and narrower panicle, and the very short points of the bracts not exceeding the perianth, whence the aspect of the plant is very different.

2. **A. Blitum,** *Linn.; Moq. in DC. Prod.* xiii. ii. 263. An erect or procumbent branching annual, attaining from 1 to 2 ft. Leaves on long petioles, ovate or rhomboidal, obtuse or obtusely acuminate, mostly 1 to 2 in. long in good soils, under 1 in. in drier places. Flowers chiefly in dense sessile axillary clusters, but also forming sometimes a short dense terminal spike. Bracts and bracteoles not exceeding the perianth. Perianth-segments almost always 3, mucronate-acute, lanceolate, scarious with a green midrib, about $\frac{3}{4}$ line long, erect or when in fruit slightly

dilated and spreading at the end. Pericarp membranous, slightly rugose, about as long as the perianth, circumsciss. Styles 2 or 3.

N. S. Wales, *Leichhardt.* Perhaps introduced.

3. **A. leptostachyus,** *Benth.* An erect annual, from under 1 ft. to about 1½ ft. high. Leaves on rather long petioles, ovate, obtuse, under 1 in. long, with the primary veins often remarkably prominent. Clusters of flowers rather loose, very numerous, the lower ones axillary, the upper ones forming a long terminal interrupted spike leafy at the base only like that of *A. interruptus.* Perianth-segments erect or scarcely spreading and persistent with the lower portion of the circumsciss pericarp as in *A. Blitum,* but usually 4 or 5 instead of 3 only.

N. Australia. Port Darwin, *Schultz.*
Queensland. Islands off Cape Flattery, *M'Gillivray.*

4. **A. pallidiflorus,** *F. Muell. Fragm.* i. 140. An erect or decumbent annual of 1 to 2 ft. Leaves on long petioles, ovate, obtuse, 1 to 3 in. long, rather thin and of a pale green. Lower cymes or clusters of flowers axillary, the upper ones in dense spikes forming a terminal panicle of ½ ft. or more, the central spike very long, the lateral ones short. Bracts and bracteoles scarious, lanceolate or ovate-lanceolate, very acute, about as long as the claws of the perianth-segments or rarely as long as the whole perianth. Perianth-segments 5, lanceolate at the time of flowering, those of the females, when in fruit with broad erect claws of about ½ line and expanded into broadly ovate mucronate-acute spreading and scarious laminæ, rather longer than the claws. Pericarp very rugose, membranous, circumsciss, with a thick apex and 3 fine styles.

N. Australia. Nichol Bay, *Walcott;* Victoria river, *F. Mueller.*
W. Australia. Port Walcott, *Harper.*

This species has precisely the aspect of and is closely allied to *A. scariosus,* Benth., from Central America, and with that species would be referred to *Sarratia* as defined by Moquin, or to *Amblogyne* as defined by A. Gray, Proc. Amer. Acad. Sc. v. 168. The American plant is indeed only to be distinguished from the Australian by the longer points to the bracts and by the retuse or emarginate laminæ of the fruiting perianth.

SECT 2. EUXOLUS.—Pericarp membranous, indehiscent or bursting irregularly, loose and separate from or close and adhering to the seed. Male flowers usually but not always trimerous or tetramerous. Fruiting perianth of 3, 4 or 5 segments usually falling off with the fruit.

5. **A. Mitchellii,** *Benth.* Apparently erect, rather stout and rigid, branching but not tall. Leaves on long petioles, ovate-lanceolate or oblong, obtuse, narrowed at the base, 1 to 2 in. long. Flowers all axillary and numerous, in sessile or shortly pedunculate cymes often ½ in. broad, rarely reduced to close clusters. Bracts scarious, nearly as long as the perianth, with a prominent midrib ending in a sharp point, the bracteoles similar but rather smaller. Segments of the fruiting perianth 5, with a rigid erect stipes of about ½ line, and a broad scarious spreading lamina at least as long, the midrib produced into a rigid point. Perianth globular, membranous, with 12 to 15 prominent undulate

longitudinal ribs, indehiscent or bursting irregularly, with a thick summit projecting beyond the perianth, and 3 short subulate stigmatic styles.—*A. undulatus*, Lindl. in Mitch. Trop. Austr. 102, not of R. Br.

Queensland. Narran river, *Mitchell*; Flinders river, *Sutherland*; Charlesville, *Giles*; Armadilla, *Barton*. Used as a vegetable, *Sutherland*, *Giles*.

N. S. Wales. Between the Darling and Cooper's Creek, *Neilson*; Ballandool river, *Locker*.

With the radiating fruiting perianth of *A. pallidiflorus*, this has the habit of *A. Blitum* or almost of *A. crassipes* (*Scleropus*, Schrad.), with the pericarp indehiscent as in *Euxolus*, but differing in its prominent ribs from all *Amaranti* known to me.

6. **A. interruptus,** *R. Br. Prod.* 414. Erect or decumbent, from 6 in. to nearly 2 ft. high. Leaves petiolate, ovate or almost rhomboidal, obtuse, ½ in. to near 2 in. long. Cymes or clusters dense or at length rather loose, the lower ones axillary, the upper ones forming a long loose spike leafy at the base, either simple or rarely with a few short branches. Bracts and bracteoles shorter than the perianth or about as long, scarcely pointed. Segments of the fruiting perianth 5, narrow, erect, slightly spathulate, shortly but finely pointed, about ¾ line long, white and scarious on the margins, dark in the centre, those of the male flowers usually 3 only and not dilated upwards. Pericarp membranous, rugose, not ribbed, indehiscent or bursting irregularly, loose over the seed with a short thick summit about as long as the perianth. Styles 2 or rarely 3.—*A. undulatus*, *A. rhombeus*, and *A. lineatus*, R. Br. l.c.; *Euxolus undulatus*, *E. rhombeus* and *E. interruptus*, Moq. in DC. Prod. xiii. ii. 272 and 275; *E. lineatus*, Moq. l.c. 276 as to the Australian, but not the Sandwich Island plant.

N. Australia. Arnhem N. Bay and neighbouring parts of the N. coast, *R. Brown*; Sandy islands, Victoria river, *F. Mueller*; N. coast, *Landsborough*.

Queensland. Rockhampton, *O'Shanesy*; Brisbane river, *Leichhardt*; Port Mackay, *Nernst*.

This species has the aspect nearly of *A. Blitum*, with the fruit of *A. viridis*, and is readily distinguished from both by the segments of the fruiting perianth almost constantly 5, not 3; they fall off with the fruit as in most species of the section *Euxolus*. Brown's four species appear to me to be scarcely even varieties of a single one. The specimens of *A. undulatus* are young, with small broad leaves on long petioles slightly crisped on the margin, the terminal spike still dense and commencing flowering. Those of *A. interruptus* are older, the spike long and loose, and most of the fruits already fallen off; the leaves are narrower than in *A. undulatus*. *A. rhombeus* is, as it were, intermediate between the two. The specimens of *A. lineatus* appear to me to be old ones of *A. interruptus* which have been eaten down, or have otherwise lost the upper part of their main stem, which has shot up branches giving it a different aspect. All are from the same localities, probably sandy or arid. Nernst's specimens from Port Mackay are very luxuriant, with broad leaves twice the size of those of most others, but not otherwise different.

7. **A. viridis,** *Linn.* An erect or decumbent annual of 1 to 2 ft. Leaves petiolate, ovate or ovate-lanceolate, obtuse, rather thin but the pinnate veins usually prominent underneath, 1 to 2 in. long. Flowers small, green with an obtuse appearance, the lower ones in small axillary sessile cymes or close clusters, the upper ones in rather loose or interrupted spikes, forming a short terminal panicle, the central spike 1 to

3 in. long, the lateral ones few and short. Bracts and bracteoles narrow, not exceeding the perianth. Perianth-segments 3, narrow, erect, scarcely ¾ line long, falling off with the fruit. Pericarp rugose, indehiscent, free from the seed, about as long as the perianth. Styles usually 3.—*Euxolus viridis*, Moq. in DC. Prod. xiii. ii. 273.

Queensland. Brisbane river, Moreton Bay, *F. Mueller;* Rockhampton, *Dallachy* and others; Nerkool Creek, *Bowman.*
N. S. Wales. Glendon, Cassilis, *Leichhardt.*
W. Australia, *Drummond, n.* 105.

Common in waste and cultivated places in the warmer regions of Europe, Asia, and Africa, and now frequent in several parts of America. Possibly introduced only into Australia.

8. **A. macrocarpus,** *Benth.* A small diffuse or decumbent plant, none of our specimens above 6 in. and some, although the whole plant, much smaller. Leaves on long petioles, obovate or oblong, very obtuse or emarginate, about ½ in. long or rather more. Flowers in dense axillary sessile nearly globular clusters, chiefly females in our specimens, the males not seen perfect. Bracts and bracteoles shorter than the perianth. Fruiting perianth of 3 rarely 5 narrow-linear erect very pointed segments sometimes slightly dilated below the point. Fruit oblong or almost bottle-shaped, 1¼ to 1½ lines long, much exceeding the perianth, the pericarp inflated, membranous and reticulate-rugose, drying black in the common form. Seed erect, obovoid, much smaller than the cavity of the fruit.

Queensland. Armadilla, *Barton;* Dawson river, *Leichhardt.*
N. S. Wales. Junction of the Murray and Darling, *F. Mueller;* Darling river, *Woolls.*

Var. *pallida.* Fruit of a pale green when dry. Perianth smaller and often reduced to 1 or 2 segments.—Curriwillighie, *Dalton.*

9. **A. tenuis,** *Benth.* Stems in our specimens single, erect, slender, 6 to 9 in. high. Leaves narrow-lanceolate, acute, the radical ones contracted into a long petiole, the lamina usually 1 to 1½ in. long, the upper ones more sessile. Flowers small, in dense axillary clusters, mostly females in our specimens, the males not seen perfect. Bracts and bracteoles very small or quite obsolete. Fruiting perianth of 4, rarely 3 or 5, oblong or oblong-lanceolate segments about 1 line long. Fruit scarcely half so long, slightly tubercular, rugose, indehiscent, and the very thin pericarp scarcely separable from the seed. Styles 2 or 3.

N. S. Wales. Lower Darling river, *Herb. F. Mueller.*

10. **A. enervis,** *F. Muell.* A small annual, branching at the base, with decumbent or erect stems not exceeding 6 in. Leaves linear-lanceolate, obtuse or acute, contracted at the base but scarcely petiolate, rather thick, nerveless or the midrib scarcely prominent, ¼ to ½ in. long. Flowers small, all in axillary clusters, but crowded in the upper part of the stem with small floral leaves forming a terminal leafy spike, chiefly females. Bracts and bracteoles rather smaller than the perianth. Male flowers few, with 3 or 4 perianth-segments and stamens. Fruiting

perianth about ½ line long, the segments usually 4, rather broad but unequal, erect, acute. Fruit about as long as the perianth, tubercular-rugose, the pericarp very thin and scarcely separable from the seed. Styles 2 (or 3 ?).—*Euxolus enervis*, F. Muell. Fragm. i. 140.

N. S. Wales. Murray and Darling rivers, *Dallachy*.

4. TRICHINIUM, R. Br.

(Goniotriche, *Turcz.*; Hemisteirus *and* Arthrotrichum, *F. Muell.*)

Flowers hermaphrodite. Perianth with a short turbinate hard tube, reduced sometimes to a slight expansion of the peduncle; segments 5, all equal or the three inner ones rather smaller, linear, rigid, usually 3-ribbed at the base, scarious at the tips or also along the margins of the upper portion, covered outside either entirely or rarely along the centre only with straight more or less distinctly articulate (several-celled) hairs giving them a plumose appearance, the short tips alone glabrous. Stamens normally 5, but usually 1, 2, or 3 of them small and without anthers, or entirely abortive, and all the filaments unequal, or more rarely all equal and antheriferous, united at the base in a membranous cup adnate to the perianth-tube or shortly free from it, without or rarely with intervening scale-like teeth or lobes, which, when present, are very thin and transparent; anthers 2-celled. Ovary uniovulate. Style simple, rigid, with a small capitate stigma. Fruit an indehiscent utricle, usually obovoid or contracted into a stipes at the base and oblique at the top, with the persistent style more or less excentrical. Seed vertical.—Herbs undershrubs or rarely shrubs, glabrous or hairy with crisped articulate woolly or stellate hairs. Leaves alternate, narrow or rarely obovate. Flowers in dense globular ovoid or cylindrical spikes, very rarely elongated and interrupted. Bracts and bracteoles scarious and shining, nerveless or with a more or less prominent midrib produced into a fine or short point. Perianths usually pink or straw-colour. Stamens and ovary often enveloped in dense wool or long hairs proceeding either from the lower part or claws of the inner perianth-segments or from the outside of the staminal cups.

The genus is limited to Australia, for the opposite-leaved *T. Zeyheri* from S. Africa, admitted by Moquin, must be referred to *Sericocoma*, the presence or absence of scales between the stamens being by no means of absolute generic importance.

This and the following genus have been united by Poiret and F. Mueller under the name of *Ptilotus*, by Sprengel under that of *Trichinium*, and they might perhaps be really better considered as sections of one genus than as two distinct ones, were it not for the useless confusion which would result in the nomenclature of species. At any rate, if the union be adopted it would be better to follow Sprengel in preferring the name of *Trichinium* for the united genus, as being that which belongs to four fifths of the species, and entails therefore the least change, besides that it is the most familiar of the two from the number of species that have been cultivated or figured. Neither name has the right of priority, both being of the same date, and both are equally apposite for the groups they designate, and equally inappropriate for the combined species, for *Trichinium* means "a clothing of hairs," *Ptilotus* "having featherless wings."

In the subdivision of the genus I have been unable to establish any natural well-characterized sections. Even the presence of the teeth or lobes of the staminal cup, considered by Moquin as at least a generic if not a tribual character, separates species which in other respects are almost identical. The groups here adopted as the best which have hitherto been suggested, are founded chiefly upon the nature and position of the different kinds of hairs. With the exception of the short stellate tomentum of the foliage in the first series, the hairs are all so-called articulate, that is, consisting of several cells, sometimes very conspicuously so, with more or less prominent denticulations at the joints or almost plumose, sometimes very fine with the articulations visible only under a very high power. These hairs are sometimes (always so on the backs of the laminæ of the perianth) straight, at first appressed afterwards spreading, sometimes, on the backs of the lower part of the perianth-segments or inside the inner ones, long and intricate forming masses of white wool, sometimes, especially on the branches, short and crisped.

Series 1. **Astrotricha.**—*Foliage hoary or white with a stellate tomentum (glabrous or with crisped or woolly or silky hairs in all the other series).*

Spikes dense, globular ovoid or shortly cylindrical, not exceeding 1 in.
Spikes ½ to 1 in. diameter. Laminæ of perianth-segments linear.
Leaves mostly broad, rather thick and densely tomentose. Spikes globular or at length ovoid. Bracts glabrous or nearly so . . . . 1. *T. obovatum.*
Leaves mostly narrow, thick and densely tomentose. Spikes ovoid, at length cylindrical. Bracts woolly . . . . . 2. *T. incanum.*
Leaves mostly narrow, rather thin, less densely tomentose. Spikes ovoid, at length cylindrical. Bracts glabrous or slightly woolly . . . . 3. *T. parviflorum.*
Spikes not above ¼ in. diameter. Laminæ of perianth-segments almost ovate . . . . 4. *T. astrolasium.*
Spikes cylindrical, above 2 in. long and 1½ in. diameter. Leaves orbicular, very densely woolly . . . . 5. *T. rotundifolium.*
Spikes elongated with distant flowers. Leaves oblong or lanceolate, the stellate hairs short and scattered . . . . 6. *T. dissitiflorum.*

(The foliage is also very densely silky-woolly in 46, *T. helichrysoides*, but the hairs not stellate.)

Series 2. **Straminea.**—*Spikes cylindrical or elongated or rarely globular,* 1 *to* 2 *in. diameter. Flowers more or less yellow or greenish, not red. Inner segments without internal dense wool, but the stamens usually surrounded by a few long hairs.*

Spikes elongated with distant flowers. Leaves filiform . . . 7. *T. distans.*
Spikes dense, at length long and cylindrical.
Leaves linear. Bracts wholly transparent. Bracteoles broad without prominent midribs. Perianth under ¾ in. . . . 8. *T. alopecuroideum.*
Leaves obovate or oblong. Bracts opaque in the centre. Bracteoles oblong or lanceolate with prominent keels.
Perianth above ¾ in. long . . . . 9. *T. nobile.*
Perianth not exceeding ½ in.. . . . . 10. *T. polystachyum.*
Spikes ovoid or shortly cylindrical, 2 in. diameter. Bracts transparent. Leaves linear . . . . 11. *T. macrocephalum.*
Spikes globular or rarely ovoid. Perianth-segments rather broad, the dorsal hairs very short . . . . 12. *T. corymbosum.*

Series 3. **Rhodostachya.**—*Spikes globular ovoid or rarely cylindrical,* 1 *to* 2 *in. diameter, terminating simple or rarely branched stems. Perianth straight, pink or red (white in* T. esquamatum), *the inner segments woolly inside towards the base.*

Spikes 1½ to 2 in. diameter.
Perianth-segments very rigid with short narrow tips. Stems erect. Spikes about 1½ in. diameter.
Spikes at length elongated and cylindrical . . . . 13. *T. exaltatum.*

    - Spikes globular or shorter than broad . . . . 14. *T. semilanatum.*
  - Perianth-segments with conspicuous coloured obtuse glabrous tips. Spikes about 2 in. diameter.
    - Stems short, decumbent. Radical leaves spathulate, the others linear . . . . 15. *T. Manglesii.*
    - Stems short erect. Leaves spathulate, all crowded at the base of the stem . . . . 16. *T. Beckerianum.*
- Spikes about 1 in. diameter. Stems erect, simple, with small narrow leaves.
  - Radical leaves oblong-spathulate. Bracts ovate-lanceolate, brown. Perianth pale pink . . . . 17. *T. gomphrenoides.*
  - Leaves all small. Bracts broad, transparent, pale-coloured. (Perianth white?) . . . . 18. *T. esquamatum.*

SERIES 4. **Incurva.**—*Spikes globular, ¾ to 1¼ in. diameter, terminating simple stems. Perianths curved upwards (straight or curved downwards in all other series), the inner segments woolly inside at the base. Leaves linear.*

- Spikes sessile within the last leaves . . . . 19. *T. declinatum.*
- Upper leaves distant, usually reduced to scarious scales . . . 20. *T. erubescens.*

SERIES 5. **Polycephala.**—*Stems mostly branched or rarely some of them long decumbent and simple, glabrous or with crisped woolly hairs. Spikes mostly globular,* ¾ to 1 *in. diameter.*

- Inner perianth-segments very woolly inside towards the base (less so in *T. helipteroides*). Bracts rather loose.
  - Shrubby with divaricate branches. Leaves linear, rigid. Spikes about 1 in. diameter . . . . 21. *T. divaricatum.*
  - Herbaceous with decumbent, ascending or erect stems. Spikes about ¾ in. diameter.
    - Leaves narrow. Stems more or less silky or woolly.
      - Bracts and bracteoles very thin, nearly as long as the perianth . . . . 22. *T. helipteroides.*
      - Bracts and bracteoles rather rigid, not half as long as the perianth . . . . 23. *T. Stirlingii.*
    - Leaves broad. Stems glabrous or nearly so except the young shoots.
      - Stamens 2, long, dilated and connate at the base on one side of the ovary . . . . 24. *T. laxum.*
      - Stamens 3 or 4 perfect, the filaments all dilated at the base forming a complete ring or cup . . . . . . 25. *T. axillare.*
- Inner perianth-segments nearly glabrous inside, the wool proceeding chiefly from the staminal cup. Bracteoles closely embracing the perianth.
  - Undershrub with divaricate branches. Leaves few, narrow and small. Panicle divaricate . . . . 26. *T. striatum.*
  - Herb with large obovate or oblong leaves chiefly radical. Stem simple at the base with a compact panicle . . . . 27. *T. auriculifolium.*
- Inner perianth-segments nearly glabrous inside. Staminal cup surrounded by long straight hairs.
  - Leaves obovate oblong or lanceolate, usually glabrous. Perianth straight. Stamens 3 or 4 perfect, connate at the base, in a complete cup or ring . . . . 28. *T. sericostachyum.*
  - Leaves oblong or lanceolate, loosely villous underneath. Perianth recurved. Stamens 2, the filaments dilated and connate on one side of the ovary . . . . 29. *T. roseum.*
  - Leaves linear-filiform. Perianth straight. Stamens 3 or 4 perfect, the filaments forming at the base a complete cup or ring.
    - Perennial with a thick rootstock. Spikes about 1 in. diameter . . . . 30. *T. fusiforme.*
    - Annual. Spikes about ¾ in. diameter . . . . 31. *T. gracile.*

Series 6. **Squamigera.**—*Spikes globular or cylindrical, ½ to 1 in. diameter. Staminal cup with transparent scale like teeth or lobes between the filaments (wanting in all the other series). Leaves narrow.*

Perennial with simple stems of 1 ft. or more. Spikes globular, about ¾ to 1 in. diameter . . . . 32. *T. Drummondii.*
Annual with slender branching stems of 1 ft. or more. Spikes cylindrical, about ½ in. diameter . . . . 33. *T. calostachyum.*
Perennial with a branching stock and slender stems of about 6 in. Spikes globular, under ½ in. diameter . . . . 34. *T. Fraseri.*

Series 7. **Spathulata.**—*Perennials with short decumbent stems leafy to the spike. Spikes sessile, within the last leaves, globular ovoid or cylindrical, ½ in. diameter or more. Leaves mostly spathulate.*

Spikes ovoid, at length cylindrical, the hairs round the base of the perianth shorter than the segments.
  Bracteoles acute, half concealed by the very plumose perianths. Perianth-tube ½ to ¾ line long . . . . 35. *T. spathulatum.*
  Bracteoles broad, obtuse, conspicuous. Perianth-segments free to the base . . . . 36. *T. pyramidatum.*
Spikes globular, at length ovoid, the bracteoles and the hairs surrounding the perianths nearly as long as the segments . . 37. *T. holosericeum.*

Series 8. **Parviflora.**—*Spikes globular, ovoid or cylindrical,* ¼ to ½ *in. diameter.*

Stems erect, branching, glabrous or slightly hairy. Annual.
  Leaves linear. Spikes conical or cylindrical, 2 or 3 together, sessile on a terminal peduncle . . . . 38. *T. Cunninghamii.*
  Leaves linear. Spikes globular or ovoid, solitary on a terminal peduncle. Perianth hairs short . . . . 39. *T. leucocoma.*
Prostrate woolly-hairy annual. Leaves lanceolate. Spikes solitary, ovate-conical. Perianth very woolly . . . . . 40. *T. villosum.*
Perennials. Branches woolly or villous, at least when young. Spikes numerous, sessile or shortly pedunculate.
  Perianth surrounded by long wool concealing the bracts and segments. Spikes cylindrical . . . . 41. *T. brachyanthum.*
  Bracts and bracteoles nearly as long as the perianth and very conspicuous.
    Branches and foliage villous. Spikes narrow cylindrical . 42. *T. arthrolasium.*
    Young shoots woolly. Leaves glabrous, broad. Spikes ovoid. Perianth-segments glabrous inside . . . . . . 43. *T. œrvoides.*
    Branches closely woolly. Leaves broad, obtuse. Spikes ovoid. Inner perianth-segments woolly inside . . . . 44. *T. Roei.*
Glabrous undershrub, with a densely tufted leaf-stock. Leaves small, nearly terete. Spike very short. Bracts conspicuous 45. *T. cæspitulosum.*

Series 9. **Helichrysoidea.**—*Low densely tufted thick perennial, closely covered with thick silky woolly leaves. Spikes nearly globular, sessile, ¾ in. diameter.*

Single species . . . . 46. *T. helichrysoides.*

Species insufficiently known.

Stem slender, branching. Leaves ovate, about 1 line long. (Spikes globular?) . . . . 47. *T. parvifolium.*

Series. 1 Astrotricha.—Foliage hoary or white with a stellate tomentum, sometimes dense soft and woolly, sometimes short and scattered. Erect branching perennials undershrubs or shrubs.

1. **T. obovatum,** *Gaudich. in Freyc. Voy. Bot.* 445, *t.* 49. An erect undershrub, from under 1 ft. to 3 or even 4 ft. high, paniculately

branched sometimes from the base sometimes at the top only, clothed with a soft dense stellate tomentum, intermixed occasionally with longer denticulate hairs but with fewer of the latter than in *T. incanum*. Leaves obovate or oblong, very obtuse or rarely mucronate-acute, contracted into a petiole rather long in the lower leaves, short in the upper ones, the larger ones attaining 2 in. but mostly under 1 in. long. Spikes nearly globular or scarcely ovoid, ½ to ¾ in. diameter, sessile or shortly pedunculate, in terminal corymbose panicles, which are sometimes compact and leafless, sometimes more spreading and leafy at the base. Bracts and bracteoles usually rather brown, obtuse or shortly mucronate-acute, glabrous or nearly so, under 2 lines long. Perianth 3 to 4 lines long in the typical form, the tube about ¼ line, segments rigid, plumose with long white hairs, the glabrous tips short obtuse and denticulate in the outer segments, the inner ones shorter and more acute, glabrous inside. Stamens unequal, 3 or 4 perfect, filaments dilated downwards, scarcely united above the perianth-tube, surrounded by a ring of long articulate hairs. Ovary usually hairy on the top. Style excentrical.—Moq. in DC. Prod. xiii. ii. 286; *Ptilotus obovatus*, F. Muell. Fragm. vi. 228; *T. incanum*, Moq. l.c. 285 not of R. Br.; *T. sessilifolium*, Lindl. in Mitch. Three Exped. ii. 13; Moq. l.c. 284; *T. lanatum*, Lindl. in Mitch. Three Exped. ii. 123; Moq. l.c. 285; *Ptilotus Lindleyi*, F. Muell. Fragm. vi. 233 (from the synonym); *T. atriplicifolium*, A. Cunn. in Moq. l.c. 286, F. Muell. Pl. Vict. t. 78 (the plate not yet received); *T. variabile*, F. Muell. in Linnaea xxv. 436; *Goniotriche tomentosa*, Turcz. in Bull. Soc. Imp. Nat. Mosq. 1849, 37 (corrected to *Goniotriche*, l.c. 1852, ii. 181).

N. Australia. N. W. coast, *Bynoe;* in the interior, *M'Douall Stuart's Expedition.*

Queensland. Narran river, *Mitchell.*

N. S. Wales. Bogan and Murray rivers, *Mitchell;* Mount Caley, Mount Flinders, &c., *A. Cunningham;* Murray and Darling rivers to the Barrier Range, *Victorian and other Expeditions.*

Victoria. Murray river, *F. Mueller.*

S. Australia. Flinders' Range, *F. Mueller, Howitt's Expedition;* Spencer's Gulf and Mount Searle, *Warburton;* Lake Gilles, *Burkitt*

W. Australia, *Drummond, n.* 74, 234; throughout the interior, *Harper;* Murchison river, *Oldfield;* Sharks Bay, *A. Cunningham, M. Brown.*

Var. *grandiflorum.* Perianth ½ in. long, the hairs surrounding the stamens more woolly and more attached to the inner perianth-segments.—Harrington plains, *Fraser, A. Cunningham;* Murray Desert, *F. Mueller, Victorian Expedition,* &c.; Cudnaka, *F. Mueller;* Gawler Ranges, *Sullivan.* Both varieties included by Moquin under *T. atriplicifolium.*

2. **T. incanum,** *R. Br. Prod.* 415, *not of Moq.* Stems erect or ascending, divaricately branched, hard and almost woody at the base, 6 in. to above 1 ft. high, the whole plant densely and softly tomentose or woolly with stellate and plumose hairs. Leaves from broadly elliptical to narrow oblong, obtuse or mucronate, contracted into a short petiole, thick and soft, the larger ones on the main stem sometimes above 2 in., those of the side branches under 1 in. long. Spikes ovoid or at length cylindrical, ½ to 1 in. long and scarcely ½ in. diameter, sessile or nearly so, forming an irregular leafy panicle, with some lateral spikes much lower

down. Bracts and bracteoles very thin and transparent, 1 to 1½ lines long, the bracts very woolly outside. Perianth scarcely above 3 lines long, the tube about ¼ line long, hirsute with short hairs, the segments rigid, plumose with long white dorsal hairs, the glabrous tips obtuse and slightly denticulate in the outer ones, shorter and acute in the inner ones, all glabrous inside except that the long hairs which, as in *T. obovatum*, surround the stamens are rather more on the base of the inner segments than in that species. Stamens 3 or 4 perfect, filaments unequal, dilated at the base but scarcely united above the perianth-tube. Ovary glabrous; style excentrical.—*Ptilotus incanus*, Poir. Dict. Suppl. iv. 620; F. Muell. Fragm. vi. 228; *T. gnaphalodes*, A. Cunn.; Moq. in DC. Prod. xiii. ii. 285.

N. Australia. N. W. coast? *Baudin's Expedition*; Dampier's Archipelago, *A. Cunningham*; Nichol Bay, *F. Gregory's Expedition*; Sturt's Creek, *F. Mueller*.

It is evident from Moquin's character as well as from Cunningham's specimens named by him, that his *T. incanum* is a form or state of *T. obovatum*. It is true that by a note of exclamation he indicates having seen an authentic specimen of Brown's, but that must be a mistake; Brown never gathered either species himself, but described *T. incanum* from specimens of Baudin's, corresponding with those described by Moquin under the name of *T. gnaphalodes*.

3. **T. parviflorum,** *Lindl. in Mitch. Three Exped.* ii. 13. A perennial or undershrub with a thick woody stock and erect branching stems, hoary as well as the foliage with a stellate tomentum, closely allied to *T. obovatum* and *T. incanum*. Lower leaves sometimes obovate, but mostly lanceolate or almost linear, obtuse, thinner than in those two species, the stellate tomentum disappearing with age on the upper surface, and not very dense on the lower. Spikes at first short, but lengthening out to about 1 in., and about ½ in. diameter, sessile or shortly pedunculate in a loose divaricate panicle. Bracts and flowers of *T. incanum*, but much less woolly.—Moq. in DC. Prod. xiii. ii. 284; *T. virgatum*, A. Cunn.; Moq. l.c. 286.

Queensland. Flinders' river, *Bowman*; Curriwillighie, *Dallon*; Armadilla, *Barton*.

N. S. Wales. Inundated plains, Lachlan river, *Mitchell*, *A. Cunningham*.

4. **T. astrolasium,** *F. Muell.* A perennial or undershrub with a thick rhizome and several erect stems of 1 ft. or more, paniculately branched in the upper part and stellately tomentose as well as the foliage. Leaves obovate or oblong, smaller than in *T. obovatum*. Spikes sessile or very shortly pedunculate, globular or at length ovoid, 3 to 4 lines diameter, forming a terminal corymbose leafy panicle. Bracts and bracteoles ovate, acute, scarious, about 1 line long, the bracts loosely tomentose outside. Perianth about 1¼ lines long, the segments free from the base, the lower portion rigid with the dorsal hairs very dense white and straight, the scarious lamina broad, almost ovate, more sparingly hairy on the back. Staminal cup truncate, surrounded by long intricate woolly hairs; filaments scarcely dilated at the base.—*Ptilotus astrolasius*, F. Muell. Fragm. vi. 233.

N. Australia. Sturt's Creek, *F. Mueller*; N. W. coast, *Hughan*.

5. **T. rotundifolium,** *F. Muell. Fragm.* iii. 122. An erect shrub of 2 or 3 ft., the branches and foliage covered with a stellate tomentum very soft and dense, almost woolly. Leaves on short petioles, nearly orbicular, very obtuse, soft and thick, about 1 to 1½ in. diameter. Spikes at first conical, becoming cylindrical, 2 or 3 in. long, and at least 1½ in. diameter. Bracts broad, acute and mucronate, scarious with dark tips, woolly outside, shorter than the bracteoles. Bracteoles at least 4 lines long, very broad and thin, shortly mucronate, glabrous or with very few woolly hairs at the base. Perianth nearly ¾ in. long, the dorsal hairs long fine and almost silky, the tube about ¾ line long, the segments narrow, scarious, obtuse, the tips not at all or very shortly glabrous outside; the three inner ones rather shorter and very densely woolly inside near the base. Stamens all antheriferous and equal or nearly so.—*Ptilotus rotundifolius*, F. Muell. Fragm. vi. 230.

N. Australia. Near Hammersley range, N. W. coast, *F. Gregory's Expedition.*

6. **T. dissitiflorum,** *F. Muell. Fragm.* iv. 89. Erect and branching, hard and almost woody at the base, the branches and foliage more or less hoary with a minute stellate tomentum, the older foliage black when dry. Leaves oval oblong or shortly lanceolate, obtuse or acute, rather thick, ½ to ¾ in. long or the upper ones smaller, contracted into a short petiole. Spikes interrupted, close above the last leaves, 1 to 3 in. long, the flowers more or less distant. Bracts ovate or lanceolate, acute, about 2 lines long, the upper ones brown and scarious, the lower ones thicker and tomentose; bracteoles rather broader and more scarious. Perianth 6 to 7 lines long, the tube nearly 1 line long and hirsute with short white hairs, the segments narrow, rigid, plumose outside, the glabrous tips not 1 line long, the three inner ones rather smaller and woolly inside towards the base. Staminal cup very woolly-hairy outside, with a few hairs also on the filaments. Ovary glabrous; style excentrical.

N. Australia. Gulf of Carpentaria, *F. Mueller.*

SERIES 2. STRAMINEA.—Spikes cylindrical elongated or rarely globular, 1 to 2 in. diameter. Flowers more or less yellow (usually a pale greenish yellow or straw colour), not red. Inner segments without the dense internal wool of the *Rhodostachya*, but the stamens usually surrounded by a few long hairs.

7. **T. distans,** *R. Br. Prod.* 415. A perennial with a hard stock at length woody, and erect virgate slender simple or branched stems of 1 to 2 ft., glabrous as well as the foliage. Leaves narrow-linear, almost filiform, the lower ones sometimes 2 in. long, the others much smaller and distant. Spikes terminal, slender and interrupted, 3 or 4 in. long, the flowers all distant, or in luxuriant specimens twice as long with the upper flowers more crowded. Bracts and bracteoles narrow-ovate or oblong, scarious and shining, 2 to 3 lines long, all similar or the bracteoles smaller narrower and more acute. Perianth about ½ in. long, the

tube about ½ line, the segments narrow, rigid, plumose on the back with small narrow glabrous tips, all glabrous inside. Staminal cup shortly free, with copious articulate hairs outside more or less continued on the filaments. Ovary hirsute on the top.—Moq. in DC. Prod. xiii. ii. 297; *Ptilotus distans,* Poir. Dict. Suppl. iv. 620; F. Muell. Fragm. vi. 228.

N. Australia. Arnhem S. Bay, *R. Brown;* Victoria river, Macadam and Sea Ranges, *F. Mueller;* S. Goulburn Island, *A. Cunningham.*
Queensland, *A. Cunningham;* Rockingham Bay, *Dallachy;* Cape river, *Bowman.*

8. **T. alopecuroideum,** *Lindl. in Mitch. Three Exped.* ii. 13, *but not of Bot. Reg.*—A perennial with ascending or erect slightly-branched stems of 1 to 3 ft., the young shoots and foliage often sprinkled with short crisped hairs, becoming at length glabrous. Leaves linear or lanceolate, acute, the lower ones often several in. long and contracted into a long petiole, the upper ones few small and more sessile. Spikes on long terminal peduncles, becoming very soon cylindrical, attaining sometimes 6 in. or more and from a little more than 1 in. to above 1½ in. diameter. Bracts and bracteoles broadly ovate or orbicular, obtuse or with a small point, wholly scarious and shining, with the central nerve scarcely conspicuous, 1½ to 3 lines long. Perianth pale yellow or straw colour, the tube exceedingly short, the segments ½ to ¾ in. long, narrow, obtuse, but appearing acute from the involution of the margins at the tip, the dorsal hairs not so copious as in some species and all glabrous inside. Staminal cup shortly prominent, surrounded by long straight hairs sometimes very few sometimes copious; stamens very unequal, one or two of the filaments usually short and without anthers. Ovary glabrous.—Moq. in DC. Prod. xiii. ii. 296; *Ptilotus alopecuroideus,* F. Muell. Fragm. vi. 227; *T. giganteum,* A. Cunn.; Moq. l.c. 296; *T. pallidum,* Moq. l.c. 295 (very tall and stout specimens); *T. Preissii,* Nees in Pl. Preiss. i. 629; Moq. l.c. 295; *T. candicans,* Nees in Pl. Preiss. i. 629; Moq. l.c. 296 (with rather broader leaves and the stems somewhat procumbent at the base).

N. Australia. Water island, Montague Sound, *A. Cunningham;* Usborne's Harbour, *Beagle Voyage;* Glenelg district, *Martin* (with a very long drawn out spike).
Queensland. Armadilla, *Barton;* Curriwillighie, *Dalton.*
N. S. Wales. Lachlan river, *Mitchell;* Lower Darling river, *Mrs. Ford;* between the Darling and the Barrier Range, *Victorian Expedition;* New England, *C. Stuart.*
Victoria. Murray river, *F. Mueller, Dallachy.*
S. Australia. Murray river to St. Vincent's Gulf, *F. Mueller and others;* Lake Gairdner, *Babbage;* Cooper's Creek, *Howitt's Expedition, Neilson.*
W. Australia. Swan river, *Fraser, Drummond, n.* 434, *Preiss, n.* 1370, 1371; Murchison river, *Oldfield, Drummond, 6th coll. n.* 221.

T. conicum, Lindl. in Mitch. Trop Austr. 363; Moq. in DC. Prod. xiii. ii. 462, not of Spreng. is the *T. alopecuroideum* in a young state just coming into flower.

9. **T. nobile,** *Lindl. in Mitch. Three Exped.* ii. 22. A stout erect, glabrous perennial, the stems simple or slightly-branched upwards, 1 to 3 ft. high. Leaves from broadly obovate to oblong, rarely lanceolate, the lower ones chiefly radical on long petioles, obtuse or mucronate, the

upper ones narrower and more sessile. Spikes terminal, oblong, attaining 3 to 6 in. in length and nearly 2 in. diameter, the rhachis very densely hairy. Bracts 3 to 5 lines long, ovate or oblong, the midrib prominent and projecting into a point, scarious but with a dark centre especially towards the tip; bracteoles similar but rather smaller and often with a few dorsal hairs. Perianth usually about 1 in. long, of a greenish yellow, the tube 1 to 1½ lines long and densely hirsute with short hairs, the segments narrow, copiously plumose with dorsal hairs, the glabrous tips short, obtuse in the outer segments more acute in the inner, all without any wool inside but a few long straight hairs round the base of the stamens, which are not united above the perianth-tube, the filaments very unequal, and 1 or 2 without anthers. Ovary glabrous.—Moq. in DC. Prod. xiii. ii. 286; *T. densum*, A. Cunn.; Moq. l.c. 289.

N. S. Wales. Lachlan river, *Mitchell;* Stratford Plains, *A. Cunningham;* from the Lachlan, Murray, and Darling rivers to the Barrier Range, *Victorian and other Expeditions.*

Victoria. Murray river, *F. Mueller.*

S. Australia. Murray desert, St. Vincent's Gulf, Flinders' Range, Cudnaka, *F. Mueller;* near Adelaide, *Whittaker.*

F. Mueller includes also under *Ptilotus nobilis* (Fragm. vi. 227) the *T. exaltatum* and *T. semilanatum*, which have similar bracts but usually smaller flowers, red not yellow, and with copious wool inside the lower part of the inner segments.

10? **T. polystachyum,** *Gaudich. in Freyc. Voy. Bot.* 445. Stem herbaceous, erect, paniculately branched. Leaves lanceolate, obtuse or shortly mucronate, contracted at the base, green and pubescent, 1½ to 2 in. long. Spikes several, distant, ovate-oblong and ¾ to 1 in. long (*Moquin*), cylindrical (*Gaudichaud*), about ¾ in. diameter. Bracts ⅓ the length of the perianth, ovate-lanceolate, acuminate; bracteoles rather longer, elliptical, obtuse, all 1-nerved, glabrous, pale brown. Perianth 5 lines long, yellowish (*Moquin*), the segments linear-spathulate with glabrous tips and short rigid white dorsal hairs, the outer ones 2-toothed at the end, the inner ones somewhat acute. Filaments filiform.—Moq. in DC. Prod. xiii. ii. 283.

W. Australia. Sharks Bay, *Gaudichaud.*

I have no specimens answering to the above character. *Ptilotus polystachyus*, F. Muell. Fragm. vi 230, to which he refers Gaudichaud's plant, includes *T. Stirlingii*, *T. roseum*, and *T. laxum*, all of which have globular spikes and pink flowers. Gaudichaud's character comes nearest to that of *T. nobile*, but with much smaller flowers. Neither he nor Moquin describe the wool or hairs, if any, surrounding the stamens.

11. **T. macrocephalum,** *R. Br. Prod.* 415, *not of others.* Stems from a hard perennial base erect or ascending, simple, stout and rigid, 1 to 2 ft. high, usually glabrous as well as the foliage. Leaves few at the base of the stem, linear or narrow-lanceolate, acute or rarely obtuse, contracted into a long petiole, 2 to 4 in. long, the upper ones smaller few and distant. Spikes solitary, at first ovoid, at length cylindrical, attaining 4 or 5 in. in length and at least 2 in. diameter. Bracts scarious and very shining, obtuse or mucronate, without prominent midribs or dark colour, about ½ in. long and the bracteoles nearly as

large. Perianth yellow, ¾ to above 1 in. long, the tube very short, the segments narrow, rigid, densely plumose outside, with short glabrous tips, all nearly equal without any internal wool, although a few of the marginal hairs at the base of the inner ones may be turned inside round the stamens. Filaments very unequal, filiform, scarcely dilated at the base, very shortly united above the perianth-tube, and surrounded by a few long hairs, the shorter filaments usually without any anthers. Ovary glabrous, but a few hairs often on the style.—*Ptilotus macrocephalus*, Poir. Dict. Suppl. iv. 620; *T. angustifolium*, and *T. pachocephalum*, Moq. in DC. Prod. xiii. ii. 293, 294; *Ptilotus pachocephalus*, F. Muell. Fragm. vi. 228; *T. fusiforme*, Lindl. in Mitch. Trop. Austr. 383, and A. Cunn. Herb., not of R. Br.

Queensland. In the interior, *Mitchell;* Newcastle Range, Burnett and Dawson rivers, *F. Mueller;* Bowen river, *Bowman;* Kennedy district, *Daintree.*

N. S. Wales. Liverpool Plains, *A. Cunningham*, *Leichhardt* (with rather smaller flowers); New England, *C. Stuart;* Darling river, *Neilson.*

Victoria. "Received by Sir J. Banks, probably from Port Phillip," *R. Brown;* Port Phillip, *Gunn;* Glenelg river, *Robertson*, *Allitt;* Bacchus Marsh, Wimmera, Station peak, *F. Mueller;* Skipton, *Whan.*

12. **T. corymbosum,** *Gaudich. in Freyc. Voy. Bot.* 444, *not of Spreng.* A glabrous perennial (or sometimes annual?) with rigid ascending or erect simple or branched stems of 1 to 2 or even 3 ft. Leaves linear or linear-lanceolate, mucronate-acute, sessile or contracted into a petiole, the larger ones 1 to 2 in. long, but mostly small and distant. Spikes globular or ovoid or rarely at length cylindrical, about 1 in. diameter, on rather long peduncles, forming a loose irregular panicle. Bracts and bracteoles broad, obtuse, thinly scarious, rather brown but without prominent midribs, not half as long as the perianth. Perianth about ½ in. long, the segments free almost from the base, all nearly equal, and glabrous inside, with broad scarious white margins, the green centre alone hirsute outside with articulate hairs much shorter than in any allied species. Stamens very unequal, the filaments shortly dilated at the base and very shortly united, 1 or 2 of the shorter ones without anthers, surrounded by a few woolly hairs proceeding chiefly from their base. Ovary glabrous. Style excentrical.—Moq. in DC. Prod. xiii. ii. 291; *T. Gaudichaudii*, Steud. Nom. Bot. ed. 2; *Hemisteirus psilotrichoides*, F. Muell. in Linnæa, xxv. 435; *Ptilotus hemisteirus*, F. Muell. Fragm. iv. 90, vi. 231.

N. Australia. Hammersley range, Nichol Bay, N.W. coast, *F. Gregory's Expedition.*

S. Australia, Lake Gillies, *Burkitt.*

W. Australia. Sharks Bay, *M. Brown;* Murchison river, *Oldfield;* Swan river, *Fraser*, *Drummond*, *n.* 432; Gordon and Blackwood rivers, *Oldfield.*

Var. *parviflora.* Perianth scarcely above 4 lines long.—Cudnaka, *F. Mueller.*

When the spike elongates, the species bears much resemblance to *T. alopecuroideum*, but the leaves are much narrower, and the shortness of the perianth-hairs gives the spike an almost glabrous aspect.

SERIES 3. RHODOSTACHYA.—Spikes globular ovoid or rarely cylindrical, 1 to 2 in. diameter, terminating simple or rarely branched stems.

Perianth pink or red (white in *T. corymbosum?*), the inner segments woolly inside towards the base or below the middle.

13. **T. exaltatum,** *Benth.* A stout perennial, with a thick stock and erect stems, attaining 2 or 3 ft., usually branching in the upper portion, glabrous or hirsute with spreading hairs. Radical and lower leaves oblong-lanceolate, attaining 3 to 5 in., rather thick, contracted into a long petiole, the upper ones small, sessile, broad or narrow, often undulate or with crisped margins. Spikes erect, on long peduncles, at first ovoid-conical, at length oblong-cylindrical, about 2½ in. diameter. Bracts and bracteoles rarely half as long as the perianth, ovate-lanceolate, mucronate, scarious with a brown midrib and sometimes broadly brown towards the end, the bracteoles usually rather shorter than the bracts. Perianth rarely above ¾ in. long and sometimes rather shorter, the tube above 1 line long, the segments narrow, rigid and almost acute, plumose outside with long articulate hairs, the short glabrous tips of a dull red colour, the inner ones with dense wool inside below the middle. Stamens unequal, the filaments dilated but scarcely united at the base, or 2 of the shorter ones without anthers. Ovary usually but not constantly glabrous in the Western specimens, hairy in the Eastern ones, contracted into a rather long stipes.—*Ptilotus exaltatus*, Nees in Pl. Preiss. i. 630 (from the character given); Moq. in DC. Prod. xiii. ii. 281; *T. macrocephalum*, Moq. l.c. 290, not of R. Br.; *T. alopecuroideum*, Lindl. Bot. Reg. 1839, t. 28, but not the plant originally described in Mitch. Three Exped.; *Ptilotus nobilis*, F. Muell. Fragm. vi. 227, partly.

N. Australia. Careening Bay, N.W. coast, *A. Cunningham*; Depuch island, *Bynoe*; Victoria river, *F. Mueller*; Nickol Bay, *F. Gregory's Expedition.*

Queensland. Suttor river, *Sutherland*; Cape river, *Bowman*; Armadilla, *Barton*; Curriwillighie, *Dalton.*

N. S. Wales. Bengalla, *Leichhardt*; between Darling river and Cooper's Creek, *Neilson.*

Victoria. Avoca and Murray rivers, *F. Mueller*; Wimmera, *Dallachy* (all with very hirsute branches).

S. Australia. Lake Gairdner, *Babbage*; Gawler Ranges, *Sullivan.*

W. Australia, *Drummond*, n. 44, 457; Murchison river, *Oldfield*; Salt river and Cape Knob, *Maxwell.*

The western specimens are mostly tall, stout, and glabrous, or nearly so, the spikes often elongated, the wool inside the perianth very copious and the ovary almost always glabrous. The Queensland and N. S. Wales specimens are often rather hairy, the ovary almost always so, and the spikes usually shorter, showing an approach to the following species (or variety?).

14. **T. semilanatum,** *Lindl. in Mitch. Trop. Austr.* 45. A perennial with a tufted stock and erect simple or slightly branched stems of 6 in. to 1 ft., more or less pubescent as well as the foliage with short crisped hairs or quite glabrous. Leaves linear or linear-lanceolate, acute, the radical ones not persistent at the time of flowering, the lower ones petiolate, 1 to 2 in. long, the upper ones more sessile and smaller, the margins flat or undulate-crisped. Spikes at first depressed or hemispherical, at length globular, about 1½ in. diameter. Bracts about 2 lines long, ovate-lanceolate, mucronate, more or less brown in the centre and tips;

bracteoles broader, more obtuse and not brown. Perianth about ¾ in. long, the tube about ½ line, the segments narrow, rigid, plumose on the back, with short glabrous pink tips; the inner ones with long wool inside below the middle not very copious. Filaments dilated at the base, shortly connate, 1 or 2 short and without anthers. Ovary hairy on the top.—Moq. in DC. Prod. xiii. ii. 462; *T. pulchellum*, A. Cunn. and *T. setigerum*, A. Cunn.; Moq. l.c. 290; *Ptilotus nobilis*, F. Muell. Fragm. vi. 227 partly.

Queensland, *Mitchell;* head of the Gilbert river, *F. Mueller;* Wide Bay, *Bidwill;* Rockhampton, *O'Shanesy;* Midge Creek, *Bowman;* Warwick, *Beckler;* Darling Downs, *Law.*

N. S. Wales. Bogan river, *Mitchell.*

The species is very near *T. exaltatum*, with which F. Mueller unites it, and from some specimens of which it is difficult to distinguish it. The spikes appear to be always short, the bracts smaller and more scarious and the foliage different.

15. **T. Manglesii,** *Lindl. Bot. Reg.* 1839 *under n.* 28. A perennial with a short hard tufted stock and decumbent ascending or rarely erect stems of ½ to 1 ft., simple or rarely with 1 or 2 branches, the whole plant except the inflorescence glabrous. Radical leaves on long petioles, ovate obovate oblong narrow-spathulate or linear, obtuse or acute, 1 to 3 in. long, the stem-leaves few narrow and very acute. Spikes globular or ovoid, above 2 in. diameter, conspicuous for the coloured tips of the perianths protruding from the long white hairs. Bracts and bracteoles broadly lanceolate, acutely acuminate, the outer ones at least more or less brown in the centre, from ½ to ¾ the length of the perianth. Perianth ¾ to 1 in. long, the tube narrow, about 1 line long, hirsute outside with short hairs; segments with glabrous obtuse pink or whitish tips of 2 to 4 lines, the remainder plumose outside with long hairs; the inner ones rather smaller and narrower, with long woolly hairs inside below the middle chiefly from the margins. Filaments dilated at the base but scarcely united above the perianth-tube, 1, 2 or 3 of them short without anthers. Ovary glabrous, contracted into a long stipes; style very excentrical, quite glabrous.—Field and Gardn. Sert. Pl. t. 52; Moq. in DC. Prod. xiii. ii. 289; *Ptilotus Manglesii*, F. Muell. Fragm. vi. 230; *T. spectabile*, Field and Gardn. l.c. t. 53; Moq. l.c. 289; *T. macrocephalum*, Nees in Pl. Pr. i. 627, not of R. Br.

N. Australia. Glenelg and Roebuck Bays, N.W. coast, *Martin.*

W. Australia. Swan river, *Drummond,* 1st *coll. n.* 435, 436, *Preiss, n.* 1358, 1359, and many others; northward to Murchison river and southward to Kalgan river, *Oldfield.*

The broad and narrow leaved specimens, distinguished as *T. Manglesii* and *T. spectabile*, are so much intermixed and connected by intermediates that they cannot be reckoned as marked varieties. The cultivated specimen figured Bot. Mag. t. 5448 has the spike much more elongated than I have seen it in any of the numerous wild ones I have had before me.

16. **T. Beckerianum,** *F. Muell. in Linnæa,* xxv. 436. A perennial with a short branching stock and erect simple stems not exceeding 6 in. in our specimens, glabrous as well as the foliage. Leaves crowded

at the base of the stem, oblong-lanceolate, acute, $\frac{3}{4}$ to nearly 2 in. long, the lower ones contracted into a petiole, the greater part of the stem bearing only a few scarious scales or very small leaves. Spikes globular or at length ovoid, about $1\frac{1}{2}$ in. diameter, much resembling those of *T. Manglesii* but smaller and the pink glabrous tips not so long. Bracts and bracteoles ovate, very scarious, slightly mucronate, with the midrib prominent, 3 to 4 lines long, the outer ones not so brown in the centre as in *T. Manglesii.* Perianth about $\frac{3}{4}$ in. long, the tube scarcely $\frac{1}{2}$ line, the segments nearly equal, the dorsal hairs not so long as in *T. Manglesii*, and the glabrous tips scarcely 1 line, the inner segments with long woolly hairs outside near the base. Filaments shortly dilated at the base but scarcely united above the perianth-tube, 1 or two short and without anthers. Ovary glabrous; style with a few long spreading hairs.—*Ptilotus Beckeri*, F. Muell. Fragm. vi. 233.

S. Australia. Scrub near Spencer's Gulf, *Wilhelmi*, *Warburton.* Very near *T. Manglesii*, but besides the difference in foliage the flowers are smaller with less prominent tips and the styles hairy.

17. **T. gomphrenoides,** *Moq. in DC. Prod.* xiii. ii. 287. A perennial with a tufted stock and erect simple stems of 1 to $1\frac{1}{2}$ ft., glabrous or sprinkled upwards with a few short hairs. Radical leaves oblong-spathulate, obtuse or mucronate, 1 to $1\frac{1}{2}$ in. long, contracted into a long petiole; stem-leaves few small and distant, sessile, linear or lanceolate, very acute. Spikes solitary, at first globular, more ovoid when fully out, about 1 in. diameter or rather more. Bracts brown with scarious margins, lanceolate or almost ovate, very acute, several empty ones often crowded at the base of the spike; bracteoles as long and equally acute, but broader and the midrib alone brown. Perianth about $\frac{1}{2}$ in. long, the turbinate tube about $\frac{1}{2}$ line, the segments plumose with fine hairs, the outer ones rather broad, scarcely ribbed, with obtuse glabrous tips, the inner ones smaller, with acute tips and woolly hairs inside below the middle. Staminal cup very short, free from the perianth-tube; filaments short, unequal, the larger ones much dilated at the base, one very short without any anther. Ovary slightly hirsute. Style excentrical.

S. Australia. S. coast, *Strutt* (*Herb. Hook.*).

18. **T. esquamatum,** *Benth.* A glabrous perennial, with the branching stock, the erect simple rigid stems of 1 to 2 ft., and the linear mucronate acute small distant leaves of *T. Drummondii*, but without the lobes of the staminal cup of that species. Radical leaves not persistent at the time of flowering as in *T. gomphrenoides.* Spikes globular or ovoid, rather above 1 in. diameter. Bracts and bracteoles ovate, mucronate, thin and shining, with slightly prominent midribs. Perianth-tube exceedingly short, segments 5 to 6 lines long, rigid, 3-nerved, with narrow scarious margins, densely plumose outside with very fine long hairs, the glabrous scarious tips broader and more obtuse in the outer than in the inner ones, glabrous inside except the long woolly hairs

surrounding the stamens some of which proceed from the base of the inner segments. Staminal cup very short; filaments rather short, not very unequal, scarcely dilated at the base, but without intervening teeth or lobes. Ovary woolly-hirsute.

W. Australia, *Drummond,* probably Swan river.

Series 4. Incurva.—Spikes globular, ¾ to 1½ in. diameter, terminating simple stems. Perianths curved upwards, the inner segments woolly inside at the base. No teeth or lobes to the staminal cup between the filaments. Leaves linear.

19. **T. declinatum,** *Moq. in DC. Prod.* xiii. ii 293. Stems from a tufted stock prostrate or shortly ascending, in some specimens only 2 or 3 in. long, in others attaining 9 or 10 in., glabrous as well as the foliage or sprinkled with a few woolly hairs, and generally a few woolly tufts on the stock. Leaves linear or narrow-lanceolate, often rather crowded, from under ½ in. to above 1 in. long, those close under the spikes often the longest. Spikes nearly globular, 1 to 1½ in. diameter, closely sessile within the last leaves. Flowers not numerous, more or less incurved as in *T. erubescens,* but larger. Bracts and bracteoles thin, broad, mucronate-acute, 3 to 4 lines long. Perianth ¾ to 1 in. long, the segments free almost from the base, narrow, rigid, plumose outside with long fine hairs, the glabrous tips short and acute; the inner segments rather smaller, densely woolly inside at the base. Staminal cup very short, glabrous, truncate; filaments scarcely or not at all dilated at the base. Ovary woolly or nearly glabrous.—*Ptilotus declinatus*; Nees in Pl. Preiss. i. 631; *T. eriocephalum,* Moq. in DC. Prod. xiii. ii. 293.

W. Australia, *Drummond, n.* 429, *Preiss, n.* 1362; Murchison river, *Oldfield.*

20. **T. erubescens,** *Moq. in DC. Prod.* xiii. ii. 293. Stems several from a thick rhizome or densely tufted stock, simple, erect or ascending, 6 in. to above 1 ft. high, glabrous as well as the foliage or sprinkled with a few woolly hairs and interspersed on the stock with tufts of hairs usually straight. Leaves linear, acute, the radical ones often 2 or 3 in. long on long petioles, the stem ones much smaller and sessile or nearly so, the uppermost distant from the spike and sometimes passing into scarious bracts. Spikes solitary, nearly globular or at length scarcely ovoid, ¾ to 1 in. diameter. Bracts and bracteoles broad, thin, with short points, closely embracing the flowers, 3 to 4 lines long, the midribs scarcely prominent. Perianth more or less curved upwards, especially when in bud, ½ to ¾ in. long, the tube about ½ line long or sometimes scarcely more than a slightly expanded disk, the segments narrow, plumose outside, the short glabrous tips obtuse in the outer ones, the inner segments with more acute tips and densely woolly inside below the middle. Filaments dilated and very shortly united at the base. Ovary hairy or glabrous.—Dietr. Fl. Univ. Ser. 2. t. 14;

Ptilotus erubescens, Schlecht. in Linnæa, xx. 575; F. Muell. Fragm. vi. 229; *T. linifolium*, A. Cunn.; Moq. in DC. Prod. xiii. ii. 292.

N. S. Wales. Barren rocky country W. of Wellington valley, *A. Cunningham.*

Victoria. Grampians? *Mitchell;* Avoca river, *F. Mueller;* Skipton, *Whan;* Glenelg river, *Robertson.*

S. Australia. Gawlertown, *Behr.;* Lofty Range, Salt Creek, *F. Mueller;* Port Adelaide, *Blandowski.*

Series 5. Polycephala.—Stems mostly branched or rarely some of them long decumbent and simple, glabrous or with crisped woolly hairs. Spikes mostly globular, ¾ to 1 in. diameter. Perianths straight or recurved. Filaments without intervening teeth or lobes.

21. **T. divaricatum,** *Gaudich. in Freyc. Voy. Bot.* 445. A glabrous shrub of 1 to 2 ft., with rigid striate spreading branches. Leaves rather distant, sessile or nearly so, linear or linear-lanceolate, obtuse or acute, rather thick, ½ to 1 in. long. Spikes globular or ovoid, nearly 1½ in. diameter, more or less pedunculate, forming compact leafy panicles. Bracts and bracteoles 3 to 3½ lines long, thinly scarious and shining, without prominent midribs, closely enveloping the perianths. Perianth 5 to 7 lines long, the tube fully ½ line long, shortly hairy outside, the segments plumose outside with long fine hairs, the outer ones with very short obtuse glabrous tips, the inner ones much shorter, with narrow tips scarcely glabrous and with dense long woolly hairs inside below the middle. Filaments unequal, not long, dilated at the base and very shortly united above the perianth-tube. Ovary stipitate, glabrous. Style excentrical.—Moq. in DC. Prod. xiii. ii. 291; *Ptilotus divaricatus*, F. Muell. Fragm. vi. 229.

W. Australia. Champion Bay and Murchison river, *Oldfield;* Sharks Bay (*Gaudichaud*), *M. Brown.*

22. **T. helipteroides,** *F. Muell. Fragm.* iii. 122. Apparently annual, with several erect or decumbent simple or branched stems of 6 in. to 1 ft., clothed as well as the foliage with silky-woolly hairs. Leaves linear or linear-lanceolate, the lower ones petiolate 1 to 2 in. long, the upper ones nearly sessile and smaller, not numerous. Spikes at first globular, at length ovoid, ¾ to 1 in. long. Bracts and bracteoles ovate, thin and transparent, the bracts acute and as long as the perianth or nearly so, the bracteoles much shorter and more obtuse. Perianth 3½ to 4 lines long, the united disk very short, but the claws forming an erect tube of about 1 line, the segments narrow and rather rigid, the dorsal hairs very fine and not dense, the inner ones rather shorter and more acute than the outer. Filaments much dilated at the base, but scarcely united above the disk, surrounded by woolly hairs not very copious proceeding from the base of the inner segments, unequal, 1 or 2 of the shortest without anthers.—*Ptilotis helipteroides*, F. Muell. Fragm. vi. 231; *T. brachytrichum,* F. Muell. Fragm. iii. 161.

N. Australia. Nichol Bay, N. W. Coast, *Gregory's Expedition;* sandy plains of the interior, *M'Douall Stuart's Expedition.*

23. **T. Stirlingii,** *Lindl. Bot. Reg.* 1839, *under n.* 28. A perennial with long procumbent or ascending simple or branched stems more or less clothed as well as the foliage with white crisped woolly hairs, sometimes dense especially on the lower part of the stems, sometimes small and rare in the upper part and leaves or accompanied by a short glandular pubescence on the peduncles. Leaves lanceolate oblong or almost linear, the lower ones obtuse and contracted into a short petiole, the upper ones small, more acute and sessile, broad or narrow. Spikes globular, solitary at the ends of the stems or loosely paniculate, ¾ to 1 in. diameter. Bracts and bracteoles scarious but rather rigid, mucronate-acute, with the midrib more or less prominent, the bracteoles about 2 lines long, the bracts usually shorter. Perianth about 5 to 6 lines long, the tube about ½ line long and shortly hispid, the segments plumose with fine hairs, long in the lower half, shorter and not so dense higher up, the outer segments with broad dentate glabrous pink tips, the inner ones with narrower tips and long woolly hairs inside near the base chiefly from the margins. Filaments more or less dilated and shortly united at the base, either all anther-bearing, or 1, 2 or 3 of them short and without anthers, or sometimes even the longer ones scarcely dilated and the anthers imperfect. Ovary stipitate, glabrous; style slightly excentrical.—Moq. in DC. Prod. xiii. ii. 297; *T. carneum*, Moq. l.c. 291.

W. Australia. Swan river, *Fraser*; Murchison river and Champion Bay, *Oldfield*; Sharks Bay, *M. Brown.*

24. **T. laxum,** *Benth.* Perennial (?) with procumbent or ascending loosely branched stems, glabrous or sprinkled with a few short crisped hairs. Leaves broadly ovate or obovate, obtuse or mucronate, the margins slightly crisped, green and not thick, contracted into a short petiole, sometimes above 1 in. long, the upper ones smaller. Spikes globular ovoid or at length shortly cylindrical, rather under 1 in. diameter, all pedunculate in a loose leafy panicle. Bracts and bracteoles ovate or oblong, obtuse or scarcely mucronate, the midrib usually prominent, the outer ones more or less brown or red at least in the centre, 2 to nearly 3 in. long, the bract usually smaller than the bracteoles. Perianth 5 to nearly 6 lines long, the tube cylindrical, about ¾ line long, resembling a thick pedicel but hollow, enclosing the stipes of the ovary; segments plumose outside with long fine hairs, the outer ones with broad coloured denticulate glabrous tips, the inner ones rather shorter, with narrower tips, and woolly hairs inside near the base chiefly from the margins. Staminal cup very short and oblique, the two upper filaments long, much dilated at the base with oblong anthers, the others short and without anthers. Ovary glabrous; style excentrical.

W. Australia. Between Cape Le Grand and Cape Paisley, *Maxwell.*

25. **T. axillare,** *F. Muell. Herb.* A perennial with prostrate or ascending branching stems of about 1 ft., the young shoots with long white woolly hairs, otherwise glabrous. Leaves ovate or elliptical, very acute,

contracted into a rather long petiole, $\frac{1}{2}$ to 1 in. long. Spikes nearly globular, about 1 in. diameter, on short axillary peduncles or flowering branchlets, usually with a few small leaves close under the spike. Bracts and bracteoles very acute and mucronate, about 3 lines long, very thin but the outer ones rather brown with prominent midribs. Perianth about 6 lines long, the short tube shortly hirsute, the segments narrow, plumose outside with long fine hairs, with short glabrous pink truncate or denticulate tips, the inner segments smaller with narrower tips and with a few woolly hairs inside at the base. Filaments 5, unequal and some without anthers, but all dilated towards the base and united in a short cup. Ovary glabrous; style quite lateral.

N. Australia. Nichol Bay, N. W. coast, *F. Gregory's Expedition.*

26. **T. striatum,** *Moq. in Herb. Hook.* A glabrous undershrub, with rather slender but rigidly divaricate striate branches. Leaves few and distant, sessile or nearly so, linear, $\frac{1}{2}$ to $\frac{3}{4}$ in. long or the upper ones smaller. Spikes at first hemispherical but at length somewhat elongated, all pedunculate forming a loose irregular leafy panicle. Bracts and bracteoles obtuse, rather broad, closely enveloping the perianth, scarious and shining without prominent midribs, about 2 lines long. Perianth about 5 lines long, very deciduous leaving the bracts persistent, the segments free almost from the base, narrow and rigid, plumose almost to the tips with long fine soft hairs, the outer ones often rather longer than the inner with more prominent tips, all glabrous inside. Staminal cup very short, surrounded by very dense long and intricate woolly hairs proceeding mostly from the cup itself; filaments unequal, the longer ones dilated downwards. Ovary glabrous; style excentrical.

W. Australia, *Drummond, n.* 430; Port Gregory, *Oldfield;* Dirk Hartog's island, *Milne* (the last two very imperfect specimens and somewhat doubtful).

Drummond's specimens were afterwards referred by Moquin to *T. divaricatum,* to which they bear some resemblance, but from which they differ in a much looser divaricate panicle, the flowers smaller, the perianth segments free to the base, and the wool surrounding the stamens proceeding from the staminal cup and not from the inner segments.

27. **T. auriculifolium,** *A. Cunn.; Moq. in DC. Prod.* xiii. ii. 287. A perennial, probably with a tufted stock. Radical leaves obovate or obovate-oblong, very obtuse, glabrous, rather thick, with undulate margins, $1\frac{1}{2}$ to 2 in. long, on rather short petioles. Flowering stems erect, 6 in. to 1 ft. high in our specimens, nearly glabrous below, clothed upwards with soft hairs, and bearing a few small distant leaves. Spikes nearly globular, 4 or 5 together nearly sessile and crowded in a terminal dense ovate panicle. Bracts broadly ovate, acute, scarcely 2 lines long; bracteoles twice as long, obtuse, very broad and enveloping the flowers, all very thin and transparent. Perianth 5 to nearly 6 lines long, the turbinate tube about $\frac{3}{4}$ line; segments narrow, nearly equal, densely plumose with rather long hairs, with short glabrous tips rounded or truncate in the outer ones, narrower in the inner ones, all glabrous inside. Staminal cup shortly free, surrounded by long woolly hairs reach-

ing to the top of the stamens and some of them proceeding from the filaments themselves; anthers often all 5 perfect. Ovary on a long stipes, woolly at the top.

N. Australia. Dampier's Archipelago, N.W. coast, *A. Cunningham.*

28. **T. sericostachyum,** *Nees in Pl. Preiss.* i. 627. Stems from a thick rhizome procumbent ascending (or erect ?), branching, 1 to $1\frac{1}{2}$ ft. long, green and glabrous as well as the foliage or sprinkled with a few woolly hairs. Leaves oblong or lanceolate, acute or obtuse, the larger ones 1 to 2 in. long, much smaller on the branches, all contracted into a petiole. Spikes at first globular, at length more ovoid, about $\frac{3}{4}$ in. diameter, sessile within the last leaves of the numerous branches. Bracts lanceolate, about 2 lines long, very thin but with a prominent green centre produced into a fine point; bracteoles about as long but broader with the midrib only slightly prominent. Perianth-segments free almost from the base, narrow, rigid, 4 to $4\frac{1}{2}$ lines long, densely plumose outside with fine white hairs, the narrow glabrous tips obtuse in the outer segments, the inner segments shorter with very short acute tips and very few hairs inside below the middle. Staminal cup short, free from the perianth, surrounded by articulate straight hairs; filaments slightly dilated at the base, very unequal, 1, 2 or 3 without anthers. Ovary glabrous.—Moq. in DC. Prod. xiii. ii. 284; *Ptilotus sericostachyus,* F. Muell. Fragm. vi. 230; *T. floribundum,* Moq. l.c. 283; *Ptilotus floribundus,* F. Muell. Fragm. vi. 233.

W. Australia. Swan river, *Collie, Drummond, n.* 149; *Preiss, n.* 1372, *Oldfield.*

29. **T. roseum,** *Moq. in DC. Prod.* xiii. ii. 284. A perennial with decumbent or ascending loosely branched stems of above 1 ft., more or less hirsute with crisped but rather spreading hairs, not so white as in *T. Stirlingii.* Leaves ovate oblong or elliptical, acute or obtuse, contracted at the base and the lower ones petiolate, green and usually loosely villous underneath; the larger ones 1 in. long, the upper ones small and distant. Spikes globular or at lenth ovoid, 1 in. diameter or rather more. Bracts and bracteoles thin, mucronate-acute, with prominent midribs, about 3 lines long or the outer ones smaller. Perianth 5 to 6 lines long, recurved, plumose outside with fine but not very long hairs, the outer ones with glabrous tips slightly dentate, the inner ones shorter with small acute tips, all glabrous inside. Staminal cup very oblique, surrounded by hairs on the upper side, the two upper filaments long shortly dilated at the base, with perfect anthers, the others very small without anthers or quite obsolete. Ovary glabrous; style very excentrical.

W. Australia. Swan river, *Drummond,* 1*st coll. n.* 433; Murray river? *Oldfield;* Vasse river, *Mrs. Molloy* (a more glabrous form, with rather smaller flowers).

30. **T. fusiforme,** *R. Br. Prod.* 415. A perennial with a fusiform rhizome and slender erect branching stems of 1 to 2 ft. Leaves narrow-linear or almost filiform, the lower ones often 2 in. long, the upper ones few small and distant. Spikes ovoid, about 1 in. diameter, on long

slender branches or peduncles. Bracteoles broad, very obtuse, closely enveloping the perianth, very thin and shining, about 2 lines long, the bracts shorter and more acute. Perianth 5 to 6 lines long, the segments free almost or quite to the base, narrow, rigid, 3-nerved, plumose outside with rather rigid long hairs, with short glabrous tips rather longer and more obtuse in the outer than the inner segments, all glabrous inside. Staminal cup very short, densely covered outside with long straight hairs; filaments unequal, all antheriferous or one without an anther. Ovary densely hairy.—Moq. in DC. Prod. xiii. ii. 294; *Ptilotus fusiformis*, Poir. Dict. Suppl. iv. 619.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* Dampier's Archipelago, N.W. coast, *A. Cunningham;* Victoria river, *F. Mueller.*

31. **T. gracile,** *R. Br. Prod.* 415. Very near *T. fusiforme*, and the structure of the flowers the same, but an annual with still more slender branching stems, the leaves filiform, the spikes globular not above $\frac{3}{4}$ in. diameter, and the perianth only about 4 lines long with much shorter glabrous tips.—Moq. in DC. Prod. xiii. ii. 294; *Ptilotus gracilis*, Poir. Dict. Suppl. iv. 620.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* N.W. coast, *Bynoe.*

SERIES 6. SQUAMIGERA.—Spikes globular or cylindrical, $\frac{1}{2}$ to 1 in. diameter. Staminal cup with transparent scale-like teeth or lobes between the filaments.

The presence of the lobes of the staminal cup, or *staminodia* of Moquin, would technically remove the three following species from the genus, but the character is so purely artificial, as not even to constitute a good section, these species being perhaps each of them more nearly allied to corresponding species in other groups than to each other.

32. **T. Drummondii,** *Moq. in DC. Prod.* xiii. ii. 292. A glabrous perennial, the stock branching at the base into several erect simple rigid but not stout stems of 1 to 2 ft., the radical leaves not persisting as in *T. gomphrenoides*. Stem-leaves linear, mucronate-acute, $\frac{1}{2}$ to 1 in. long, sessile or nearly so, or the lower ones longer and petiolate, the uppermost small and distant. Spikes globular or at length ovoid, $\frac{3}{4}$ in. diameter or rather more. Bracts and bracteoles broad, obtuse or shortly mucronate, thin and shining, 2 to 3 lines long. Perianth 4 to 5 lines long, the tube turbinate about $\frac{1}{2}$ line, the segments rigid, scarcely ribbed, densely plumose outside with very fine hairs, with scarious margins and glabrous tips, the outer ones obtuse, the inner ones rather shorter and woolly inside below the middle. Filaments not very unequal, flat and tapering to the top, very shortly united above the perianth-tube, with oblong fringed exceedingly thin and transparent scales between them, surrounded by loose woolly hairs besides those proceeding from the inner segments. Ovary glabrous.—*Ptilotus Drummondii*, F. Muell. Fragm. vi. 229; *T. fusiforme*, Nees in Pl. Preiss. i. 626, not of R. Br.

W. Australia. Swan river, *Collie, Drummond*, 1st coll. *n.* 431, *Preiss, n.* 1374; Champion Bay, *Oldfield;* Walker's Brook, *Maxwell.*

The general resemblance of this plant to *T. exquamatum* is so close that it is not readily distinguished without examining the flowers. The spikes are, however, usually but not quite constantly, considerably smaller.

33. **T. calostachyum,** *F. Muell.* An erect slender slightly branched annual of 1 to 2 ft. Leaves few, very narrow-linear almost filiform, the lower ones 1 to 2 in. long, the upper ones small and distant. Spikes on slender peduncles, at first conical, at length oblong-cylindrical, 1 to 1½ in. long. Bracts and bracteoles ovate, mucronate, very thin and shining, 1½ to 2 lines long. Perianth pink, 2½ to 3 lines long, the segments free from the base, scarious, densely plumose outside with fine hairs short in the lower part, longer in the upper half, with shortly glabrous obtuse tips, the 3 inner ones rather shorter, with woolly hairs inside towards the base but on the segments and not on the staminal cup. Filaments slightly unequal, all bearing anthers, united in a short cup with linear or lanceolate exceedingly thin scales between them fringed or glandular on the margin. Ovary glabrous.—*Arthrotrichum calostachyum*, F. Muell. in Trans. Bot. Soc. Edinb. vii. 500; *Ptilotus calostachyus*, F. Muell. Fragm. vi. 231.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* Upper Victoria river, Hooker's and Sturt's Creeks, *F. Mueller;* Nichol Bay, *Walcott;* Roebuck Bay, *Martin.*

The habit approaches that of some of the annual *Ptiloti,* the scales between the stamens are somewhat variable but present in all the flowers examined, usually about ½ line long, the other characters are entirely those of *Trichinium.*

34. **T. Fraseri,** *A. Cunn.*; *Moq. in DC. Prod.* xiii. ii. 295. Stems from a woody but rather slender branching base, erect, slender, about 6 in. high, glabrous as well as the foliage. Leaves small, very narrow-linear, almost terete. Spikes small, probably globular when perfect. Bracts and bracteoles thin, acute, 2 to 2½ lines long. Perianth scarcely exceeding the bracts, the segments free from the base, plumose outside, the tips shortly glabrous; the inner segments rather smaller with a few of the marginal hairs below the middle turned inside. Staminal cup glabrous; filaments rather short, filiform, all nearly equal and bearing anthers, with oblong transparent fringed scales between them.

N. S. Wales, *Fraser*, the precise station not given.

SERIES 7. SPATHULATA.—Perennials with short decumbent stems leafy to the spike. Spikes globular ovoid or cylindrical, sessile within the last leaves. Perianths straight. Filaments without intervening teeth or scales. Leaves mostly spathulate.

35. **T. spathulatum,** *R. Br. Prod.* 415. A perennial with a thick woody rhizome and spreading prostrate stems of 3 to 6 in. without the spike, glabrous as well as the foliage or nearly so. Radical leaves ovate or spathulate, obtuse, ½ to 1 in. long and more or less decurrent on the long petiole; stem-leaves smaller narrow more acute and scarcely petiolate, those immediately under the spike again rather larger. Spikes ovate, at length cylindrical, sessile within the last leaves, 2 to 4 in. long

and ¾ to 1 in. diameter, of a yellowish hue. Bracts and bracteoles thin and shining, mostly acute, about 3 lines long. Perianth 4 or 5 lines long, the tube narrow, about ¾ line, the segments densely plumose outside, with long hairs denticulate at the points the outer ones with very short more or less truncate and denticulate glabrous tips, the inner ones rather shorter, tapering into entire or scarcely toothed tips. Filaments dilated and very shortly united at the base, surrounded by articulate hairs not very copious, all bearing anthers or one of them short and without any anther. Ovary glabrous; style excentrical.—Moq. in DC. Prod. xiii. ii. 287; Hook. f. Fl. Tasm. i. 310, t. 94; *Ptilotus spathulatus*, Poir. Dict. Suppl. iv. 620; *Trichinium mucronatum*, Nees in Pl. Preiss. i. 628; Moq. l.c. 288.

Victoria. Murray and Avoca rivers, *Dallachy, F. Mueller;* Melbourne, *Harvey* and others; Skipton, *Whan;* Little river, *Fullagar.*

Tasmania. Derwent river, *R. Brown;* abundant on dry plains near Ross, *J. D. Hooker.*

S. Australia. Enfield, Barossa and Lofty Ranges, *F. Mueller* (the specimens from the latter locality luxuriant with branching stems of nearly 1 ft.); Venus Bay, *Warburton;* Gawler Ranges, *Sullivan.*

W. Australia, *Drummond, n.* 128; Mount Brown, York district, *Preiss, n.* 1373; Vasse river, *Mrs. Molloy.*

36. **T. pyramidatum,** *Moq. in DC. Prod.* xiii. ii. 288. A small plant probably perennial, with a tufted stock and ascending or erect stems not above 1 in. without the spike in our specimens, glabrous as well as the foliage or woolly-hairy under the spike. Leaves small, oblong-spathulate, the radical ones petiolate, the others sessile. Spikes terminal, solitary or 2 or 3 together, conical and about 1 in. long in our specimens but probably at length longer and cylindrical. Bracts and bracteoles broad, very thin, about 2 lines long, the bracteoles very obtuse, the bracts more acute with an opaque midrib. Perianth 4 lines long or rather more, the segments free from the base, densely plumose outside with soft white hairs, the inner ones smaller and more acute than the outer. Staminal cup very short, surrounded by straight articulate hairs proceeding from the base of the inner segments; filaments unequal, 1, 2 or 3 of them short and without anthers or quite deficient. Ovary glabrous.—*Ptilotus pyramidatus*, F. Muell. Fragm. vi. 230.

W. Australia, *Drummond, n.* 99, 221. Perhaps a depauperated state of a species usually larger.

37. **T. holosericeum,** *Moq. in DC. Prod.* xiii. ii. 287. A perennial with the thick rhizome tufted stock and short procumbent stems of *T. spathulatum*, glabrous as well as the foliage or the young shoots sprinkled with a few silky hairs. Radical leaves obovate or oblong-spathulate, ½ to 1 in. long, on long petioles, the stem-leaves few and small. Spikes sessile within the last leaves, globular or at length scarcely ovoid, about ¾ in. diameter, whiter and more shining than in *T. spathulatum*, the broad shining bracts being larger in proportion to the perianth and more conspicuous. Perianth about 5 lines long, the tube about ½ line long, the segments narrow, densely plumose outside

with silky hairs less prominently articulate than in *T. spathulatum* and not denticulate, all very long and the lower ones as long as the whole perianth; the outer segments with very short rounded glabrous tips, the inner ones more acute, with long wool inside below the middle. Filaments slightly dilated and very shortly united at the base, all nearly equal or 1 or 2 short and without anthers. Ovary glabrous.—*Ptilotus holosericeus*, F. Muell. Fragm. vi. 229.

W. Australia, *Drummond, n.* 75 *and* 232.

SERIES 8. PARVIFLORA.—Spikes globular ovoid or cylindrical, ¼ to ½ in. diameter, filaments without intervening teeth or scales.

38. **T. Cunninghamii,** *Benth.* An erect rather flaccid slightly branched annual, attaining 1 ft. or more, glabrous or sprinkled as well as the foliage with a few soft hairs. Leaves linear or linear-lanceolate, acute or obtuse, contracted into a petiole, the lower ones often 2 in. long, the upper ones distant. Spikes solitary or in a cluster of 2 or 3, at first conical, at length oblong (or cylindrical?) above ½ in. long and about ¼ in. diameter, but the old ones of our specimens imperfect. Bracts and bracteoles very thin and transparent, the bracteoles broad and about ½ line long, the bracts narrower more acute and rather longer. Perianth 1½ lines long, the segments free almost from the base, transparent, narrow, densely clothed outside with white hairs, woolly on the lower half, straight on the upper half, all glabrous inside but the marginal wool towards the base of the inner ones slightly turned inwards. Staminal cup short; filaments slender, rather unequal but all bearing anthers, without intervening teeth or scales. Ovary glabrous. —*Ptilotus lanatus*, A. Cunn.; Moq. in DC. Prod. xiii. ii. 281.

N. Australia. Point Cunningham, Cygnet Bay, N. W. Coast, *A. Cunningham.* I have not adopted Cunningham's specific name because in transferring the plant to *Trichinium* it is wholly inappropriate, and, moreover, might create confusion owing to there having been a *T. lanatum*, Lindl. (now reduced to *T. obovatum*), besides a *T. semilanatum*, Lindl., still retained.

39. **T. leucocoma,** *Moq. in DC. Prod.* xiii. ii. 292. Probably herbaceous, erect or ascending, rather slender, slightly branched, glabrous or nearly so, our specimens not exceeding 6 in., with linear or linear-lanceolate flaccid leaves not above 1 in. long. Spikes at first globular at length oblong, ½ to ¾ in. long and nearly ½ in. diameter. Bracteoles broad obtuse or with small points, thin and shining, 1 to 1½ lines long; bracts usually not so broad and more pointed, and often shorter. Perianth about 2½ lines long, the tube rather thick ½ line long, the segments rigid with scarious margins, the dorsal hairs not so dense nor so long as in most species, the tips shortly glabrous truncate and denticulate in the outer segments, more acute but not shorter in the inner ones, all glabrous inside. Staminal cup shortly free near the base of the perianth-tube, surrounded by woolly hairs; filaments scarcely dilated. Ovary glabrous.

S. Australia. Great marsh of the interior, *Strutt* (*Herb. Hook.*).

40. ? **T. villosum,** *Nees in Pl. Preiss.* i. 628. An annual with prostrate simple slender villous stems. Leaves petiolate, the radical ones spathulate, the stem ones narrow-lanceolate, acute, undulate, clothed with rather long woolly hairs, about 1 in. long. Spikes solitary, ovate-conical, obtuse, 5 lines long. Bracts ovate, finely pointed, 1 nerved, whitish transparent and shining, loosely villous, as long as the perianth. Perianth greenish white, about 3 lines long, the segments mucronate-acute, very densely woolly.—Moq. in DC. Prod. xiii. ii. 285.

W. Australia. Swan river, *Preiss. n.* 1365 (*Nees*). I have seen no specimen corresponding with the above character. The plant is said to be allied to *T. incanum*, but does not appear to have any stellate tomentum, and the habit must be widely different. The internal structure of the flower and the precise position of the wool are not described.

41. **T. brachyanthum,** *F. Muell. in Herb. Hook.* A perennial with a hard almost woody rhizome and several erect or ascending simple or branched stems under 1 ft., clothed with a short soft woolly tomentum, the foliage glabrous or nearly so. Leaves from ovate-oblong to almost linear, very obtuse, contracted into a petiole, rather thick and soft, rarely above 1 in. long. Spikes terminal, solitary and shortly pedunculate, or 2 together and almost sessile, at first globular, at length oblong-cylindrical, ½ to ¾ in. long and 4 to 5 lines diameter. Bracts and bracteoles broad, thin, shining, obtuse or with minute points, scarcely above 1 line long. Perianth 1½ to 2 lines long, the tube reduced to a very small open disk, but very densely clothed outside with long woolly hairs enveloping the whole fruiting perianth; segments plumose to the top with long straight hairs, the inner ones woolly inside towards the base. Staminal cup nearly ½ line long, glabrous, truncate; filaments unequal, 1 or 2 sometimes without anthers. Ovary glabrous.

N. Australia, *F. Mueller.* Included by F. Mueller, Fragm. vi. 233, as a lanuginous variety in *T. arthrolasium*, but appears to me to be distinct in habit and inflorescence as well as in the wool.

42. **T. arthrolasium,** *F. Muell.* A perennial or undershrub with a thick rhizome and erect much branched stems under 1 ft. high, hard and almost woody at the base, clothed as well as the foliage with articulate crisped hairs, usually dense and fulvous on the branches. Leaves lanceolate or oblong-linear, obtuse or acute, contracted into a short petiole, rather thick and soft, ½ to 1 in. long. Spikes at first conical but very soon elongated, ½ to ¾ in. long, rather numerous, shortly pedunculate, forming a corymbose leafy panicle. Bracts and bracteoles thin and shining, mucronate-acute, glabrous or the outer ones slightly hairy, 1 to 1½ lines long. Perianth about 1½ lines long, the very short tube densely surrounded by straight hairs longer than the whole perianth; segments narrow-lanceolate, nearly equal, acute, scarious, plumose outside with straight hairs very much shorter than the basal ones, all glabrous inside, but a few of the marginal hairs of the inner ones turned inside. Staminal cup free, truncate, not sur-

rounded by hairs. Ovary glabrous.—*Ptilotus arthrolasius*, F. Muell. Fragm. vi. 232.

N. Australia. Sturt's Creek, *F. Mueller.*

43. **T. ærvoides,** *F. Muell. Fragm.* iii. 123. Probably perennial and procumbent. Stems branching, the young shoots and peduncles clothed with white woolly hairs. Leaves ovate or ovate-lanceolate, acute, contracted into a rather long petiole, ½ to 1 in. long. Spikes numerous, solitary or 2 or 3 together on short axillary or terminal peduncles, ovoid or conical (or at length cylindrical?), 3 to 4 lines diameter. Bracts ovate, acute, with brown tips, the bracteoles more transparent broader and more obtuse, all about as long as the perianth and usually bearing dorsal hairs at the base. Perianth scarcely 2 lines long, the segments free from the base, rigid, acute, plumose outside with short glabrous tips, glabrous inside. Filaments unequal, united at the base in a short glabrous truncate cup, 1, 2 or 3 of them without anthers. Ovary densely villous on the top.—*Ptilotus ærvoides*, F. Muell. Fragm. vi. 231.

N. Australia. Nichol Bay, N.W. Coast, *F. Gregory's Expedition.*

44. **T. Roei,** *F. Muell. Herb.* Probably perennial and procumbent, closely allied to *T. ærvoides*, the branches white with a close cottony wool. Leaves petiolate, obovate or orbicular, obtuse or the upper ones mucronate, ½ to 1 in. long. Bracts and bracteoles more rigid and villous than in *T. ærvoides*, nearly as long as the perianth. Perianth nearly 3 lines long, the segments rigid and erect in the lower half, the upper half lanceolate spreading, plumose outside with glabrous tips, the inner ones densely woolly inside below the middle. Filaments unequal, 1 or 2 without anthers. Ovary glabrous.

W. Australia. Lake Barlee, *Forrest's Expedition.*

45. **T. cæspitulosum,** *F. Muell.* A perennial with a densely tufted stock, the crowded short branches covered with the imbricate persistent remains of old leaves, the flowering branches slender, erect, simple, 3 to 5 in. high. Leaves crowded on the short cæspitose barren branches, distant on the flowering ones, linear-terete, mucronate-acute, 1½ to 3 lines long, with a small thick callous and persistent base. Spikes terminal, shortly conical, 4 to 6 lines long. Bracts and bracteoles nearly 2 lines long, very broad, closely enveloping the perianths, thin and shining, the midrib produced into a small point, glabrous except a few hairs at the base. Perianth-tube short, the segments shortly exceeding the bracts, very obtuse, densely plumose outside with straight hairs, the glabrous ends nearly ⅓ of the whole segment. Perfect stamens 2 only, with very short filaments. Style short.—*Ptilotus cæspitulosus*, F. Muell. Fragm. vi. 232.

W. Australia, *Drummond, n.* 189. The specimens are not in a good state, and I have been unable to ascertain the precise form of the staminal cup.

SERIES 9. HELICHRYSOIDEA.—Characters the same as of the species.

46. **T. helichrysoides,** *F. Muell.* A low perennial with a hard thick densely-branched stock covered by the withered remains of old leaves, the leafy flowering stems not above a few in. high, densely clothed with a woolly tomentum more silky shining and silvery on the fresh foliage. Leaves crowded up to the spike, sessile, elliptical, oblong or almost ovate, obtuse with a short fine point, thick and silky tomentose on both sides, about ½ in. long. Spikes sessile within the last leaves, depressed-globular, ¾ in. diameter or rather more. Bracts and bracteoles broadly ovate, about 2 lines long, scarious and shining but usually with a tuft of woolly hairs on the back. Perianth about 4 lines long, the tube turbinate, about ½ line long, the segments densely plumose outside with fine hairs rather long and silky on the lower portion, shorter on the upper portion, the glabrous tips very short; all glabrous inside. Filaments slightly dilated towards the base and very shortly united, surrounded by very few hairs only, but the ovary very densely hirsute.—*Psilotrichum helichrysoides*, F. Muell. Fragm. i. 237; *Ptilotus helichrysoides*, F. Muell. Fragm. vi. 231.

W. Australia, *Drummond:* hills near Baker's Well, Port Gregory, *Oldfield.*—The species has no immediate affinity with any other one known.

Species insufficiently known.

47. **T. parvifolium,** *F. Muell. Rep. Babb. Exped.* 19. Of this the only specimen is a slender branching fragment, not 6 in. long, pubescent with a few short woolly hairs. Leaves few, minute, ovate or lanceolate, acute, none of them above 1 line long. No perfect spikes on the specimen, but only a very few flowers apparently like those of *T. semilanatum* but smaller.—*Ptilotus parvifolius*, F. Muell. Fragm. vi. 229.

S. Australia. Stuart's Creek, *Babbage's Expedition.*

5. PTILOTUS, R. Br.

Flowers hermaphrodite. Perianth-segments 5, linear, free or united in a very short tube at the base, rigid, the lower portion usually 3-ribbed and glabrous, or covered outside with articulate hairs or intricate wool, the upper moiety a glabrous coloured lamina, all glabrous inside, or the inner ones with woolly hairs below the lamina. Stamens 5, one or two of them sometimes small without anthers, all united in a short cup or ring at the base, without intervening teeth or lobes; anthers 2-celled. Ovary uniovulate; style central or slightly excentrical. Fruit an indehiscent utricle. Seed vertical.—Herbs mostly (or always?) annual and glabrous except the inflorescence. Flowers in globular conical or cylindrical spikes, with a woolly rhachis. Bracts and bracteoles scarious.

Like *Trichinium*, the genus is probably limited to Australia. *P. corymbosus* is indeed said to be found also in the island of Flores in the Moluccas, but from Blume's short character it is doubtful whether it be the same as the Australian plant of that name, or even a congener. *P. amabilis*, Span., from Timor, has never been described; *P. ovatus*, Moq., from E. India, with opposite leaves, is a *Psilotrichum*, *P. Sandwicensis*, A. Gray, from the Sandwich Islands, is an *Achyranthes*.

The genus only differs from some of the smaller flowered *Trichinia*, in the absence of the dorsal hairs which, in the latter genus, give the laminæ of the perianth-segments a plumose appearance.

Perianths glabrous outside except a few hairs round the base. Leaves linear.
  Spikes globular or scarcely ovate.
    Filaments dilated under the anthers . . . . 1. *P. conicus.*
    Filaments filiform except at the base.
      Perianth not exceeding 2 lines. Bracts mostly acute and appressed . . . . 2. *P. corymbosus.*
      Perianth 3 to 4 lines long. Bracts broad, mostly obtuse and loose . . . . 3. *P. grandiflorus.*
  Spikes at first conical, at length cylindrical . . . . 4. *P. spicatus.*
Perianths enveloped in dense white cottony wool proceeding from the lower half. Leaves oblong-lanceolate or obovate.
  Spikes cylindrical. Leaves oblong.
    Spikes sessile . . . . 5. *P. Murrayi.*
    Spikes pedunculate . . . . 6. *P. gomphrenoides.*
  Spikes globular. Leaves obovate . . . . 7. *P. latifolius.*
Perianths enveloped in long dense articulate hairs proceeding from the lower half. Leaves narrow.
  Spikes globular or ovoid. Leaves lanceolate or oblong.
    Stout plant. Spikes $\frac{1}{2}$ in. diameter . . . . 8. *P. macrotrichus.*
    Small slender plant. Spikes $\frac{1}{4}$ in. diameter . . . . . . 9. *P. villosiflorus.*
  Spikes cylindrical. Leaves linear . . . . 10. *P. humilis.*

1. **P. conicus,** *R. Br. Prod.* 415. An erect glabrous annual, closely resembling *P. corymbosus*, but usually more rigid, 1 to 2 feet high, with elongated branches. Leaves very narrow-linear as in that species. Spikes few on long peduncles, larger than in *P. corymbosus*, globular and 5 lines diameter, or at length ovoid and 7 or 8 lines long. Bracts narrow, acute or aristate, shorter than the perianth. Perianth-segments all scarious, or the inner ones more rigid and slightly ribbed at the base, 2$\frac{1}{2}$ to nearly 3 lines long. Filaments much dilated towards the base, and again shortly dilated and obcordate under the anthers.—Moq. in DC. Prod. xiii. ii. 282; *Trichinium conicum*, Spreng. Syst. i. 816.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* Goulburn islands, *A. Cunningham;* Port Essington, *Armstrong.*

2. **P. corymbosus,** *R. Br. Prod.* 415. An erect slender glabrous annual of about 1 ft. or rather more, loosely and corymbosely branched at the top or nearly from the base. Leaves very narrow-linear, acute, the lower ones often nearly 2 in. long, those of the branches very small. Spikes small, at first hemispherical, at length globular or almost ovoid, glabrous outside. Bracts and bracteoles ovate, scarious, minutely mucronate, much shorter than the perianth. Perianth-segments all equal, about 2 to 2$\frac{1}{2}$ lines long, acute, the two outer ones scarious almost from the base, glabrous inside as well as out, the three inner ones more rigid, ribbed, and woolly inside in the lower half or claw.

Filaments filiform to the top, slightly dilated at the base and united in a very short cup.—Moq. in DC. Prod. xiii. ii. 282; *Trichinium corymbosum*, Spreng. Syst. i. 816 not of Gaudich.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* N.W. Coast, *Bynoe;* Victoria river and Sturt's Creek, *F. Mueller.*

Var. *acutiflorus.* Perianth-segments more acute; bracts and bracteoles almost aristate.—Arnhem's Land, *M'Kinlay.*

3. **P. grandiflorus,** *F. Muell. Fragm.* i. 237. An erect slender rather weak branching annual of 6 in. to 1 ft., glabrous or nearly so. Leaves linear or linear-lanceolate, acute, the larger ones 1 to 1½ in. long and contracted into a petiole, the upper ones small and distant. Spikes pedunculate, at first nearly globular, at length somewhat ovoid, about ¾ in. diameter when fully developed. Bracts and bracteoles thin and transparent, mucronate, 2 to 2½ lines long, the bract rather broadly ovate, the bracteoles narrower. Perianth 4 to 5 lines long, surrounded by straight articulate hairs a few of which are on the perianth itself at the base, otherwise quite glabrous, the segments free from the base, obtuse, scarious, pink, the inner ones scarcely shorter, without any wool inside. Staminal cup short, surrounded by articulate straight hairs, the filaments rather short, all nearly equal, with perfect anthers. Ovary glabrous.

W. Australia. Champion Bay and Murchison river, *Oldfield.*

Var. *lepidus.* Spikes and flowers smaller, the perianth scarcely above 3 lines long. I can detect no other difference.—*P. lepidus*, F. Muell. Fragm. iv. 89.—Sharks Bay, *M. Brown.*

4. **P. spicatus,** *F. Muell. Herb.* An erect glabrous annual (or with a perennial rhizome?) of 1 to 2 ft., with long branches bearing usually each a single spike as in *P. conicus.* Leaves narrow linear or rarely linear-lanceolate acute, the larger ones 2 in. long. Spikes at first shortly conical, at length cylindrical and above 1 in. long. Bracts and bracteoles narrow, acute or aristate, shorter than the perianth. Perianth about 2½ lines long, surrounded at the base by a dense ring of rigid hairs some of which are also on the lower portion or claws of the segments; segments free from the base, the upper half scarious coloured (pink or red), obtuse and quite glabrous, the 3 inner ones woolly inside below the middle. Staminal cup very short, the filaments not very unequal, filiform, scarcely dilated at the base.

N. Australia. Victoria river, *F. Mueller.* Included in *P. corymbosus* by F. Mueller, Fragm. iii. 125.

Var. *leianthus.* Claws or lower portion of the perianth-segments without any or scarcely any dorsal hairs.

N. Australia. Gulf of Carpentaria, *Leichhardt;* Attack Creek, *M'Douall Stuart's Expedition.*

Queensland. Flinders' river, *Bowman, Sutherland.*

5. **P. Murrayi,** *F. Muell. Fragm.* iii. 145. A small apparently prostrate branching annual (or perennial?) our specimens not exceeding 2 or 3 in. but not the entire plant. Leaves oblong, obtuse, under ½ in.

long, contracted into a petiole, glabrous as well as the branches. Spikes axillary and terminal, sessile, at first globose, at length oblong or cylindrical and about ½ in. long and 2½ to 3 lines diameter, the pink tips of the perianths just appearing above the white wool. Bracts and bracteoles ovate, obtuse, scarious, glabrous, scarcely above ½ line long. Perianth about 1¼ lines long, with a very short turbinate base, the segments thinly scarious with a red centre, glabrous in the upper half, the lower half covered outside with a long dense intricate white wool. Filaments slender, nearly as long as the perianth, united at the base in a truncate ring, slightly prominent from the perianth-tube; anthers all 5 perfect (or one sometimes abortive?). Fruit glabrous; style rather excentrical.

S. Australia. Flooded tracts of Wills' Creek, *Howitt's Expedition.*

6. **P. gomphrenoides,** *F. Muell. Fragm.* vi. 233 (*name only*). Apparently erect, slender, glabrous, slightly branched, our specimens 6 in. long, but not the whole plant. Leaves oblong-lanceolate, ½ to 1 in. long, contracted into a long petiole. Spikes at length cylindrical and ½ in. long, the pink tips of the perianths just appearing above the white wool that envelops their base and the internal structure of the flowers entirely as in *P. Murrayi*, except that the spikes are borne on slender peduncles and the flowers perhaps a trifle larger.

N. Australia. Hammersley Range, N.W. coast, *F. Gregory's Expedition.* The accompanying label however in Herb. F. Muell. has evidently been by some accident misplaced, for it indicates a "tree or shrub 18 in. to 2 ft. high."

7. **P. latifolius,** *R. Br. App. Sturt's Exped.* 25. Stems erect, much branched, herbaceous (annual? or from a thick rhizome?) "attaining 2 ft." the branches and young foliage covered with an intricate white cottony wool, the older leaves becoming glabrous. Leaves obovate, very obtuse, rather thick, with slightly crisped margins, contracted into a rather long petiole, the largest leaves in the specimens scarcely 1 in. long, the upper ones much smaller. Spikes nearly globular, fully ½ in. diameter, numerous, sessile or shortly pedunculate, terminal or in the upper axils, usually with one or two small herbaceous leaves close under them. Bracts and bracteoles thinly scarious, white and shining, very broadly ovate or almost orbicular, obtuse, loose or spreading, 2½ to 3 lines long. Perianth not 2 lines long, the base a very short open disk, the segments with a narrow base densely clothed outside with long woolly hairs, glabrous inside, the lamina or upper half rather broader obtuse (pink?) and glabrous. Stamens all perfect and nearly equal in the flowers examined. Ovary glabrous.—F. Muell. Fragm. vi. 232.

S. Australia. Sand ridges, Wills' Creek, *Howitt's Expedition.* I have not seen Sturt's specimens described by R. Brown.

8. **P. macrotrichus,** *F. Muell. Fragm.* iv. 90, vi. 232. Erect and branching with the habit of *P. latifolius*, 1 ft. high or more, the branches and foliage sprinkled with a few woolly hairs and sometimes almost glabrous. Leaves on long petioles, lanceolate or oblong, obtuse or acute,

rather thick, the lower ones above 1 in. long, the upper ones smaller. Spikes nearly globular, fully ½ in. diameter, numerous, sessile or shortly pedunculate, terminal or in the upper axils, with 1 or 2 small herbaceous leaves close under them. Bracts and bracteoles thinly scarious, white and shining, very broadly ovate, obtuse, loose or spreading, about 2 lines long. Perianth not 2 lines long, the segments free almost to the base, the lower half opaque and densely covered outside with long white silky-woolly hairs exceeding the perianth, the upper half or lamina obtuse scarious coloured and glabrous, the three inner ones with a small quantity of wool inside below the middle. Stamens short, scarcely united at the base. Ovary glabrous.

W. Australia, *Drummond, 6th coll. n.* 222; Sharks Bay, *M. Brown.*

9. **P. villosiflorus,** *F. Muell. Fragm.* iii. 125. A small slender annual with erect or decumbent branches not above 3 in. high in the single specimen known, the branches loosely woolly. Leaves small, linear or lanceolate, obtuse, contracted into a long petiole, glabrous or slightly woolly. Spikes globular, numerous and sessile or nearly so as in *P. macrotrichus*, but only ¼ in. diameter. Bracts and bracteoles as long as the perianth, and perianth-segments with long silky-woolly hairs on the lower half with the upper half or lamina glabrous, all entirely as in *P. macrotrichus* but scarcely above half the size.

N. Australia. Nichol Bay, *F. Gregory's Expedition.* The single specimen may be only a young starved and small-flowered state of *P. macrotrichus.*

10. **P. humilis,** *F. Muell. Fragm.* vi. 229. A small glabrous annual, branching at the base, with several prostrate slender stems, usually simple and 2 to 4 in. long, but sometimes ascending slightly branched and attaining at least 6 in. Leaves linear or linear-spathulate, obtuse or the upper ones mucronate-acute, mostly about ½ in. long besides the petiole, which is long in some specimens, very short in others. Spikes at first ovate, at length oblong, attaining fully 1 in. in length and about ½ in. diameter, the central one usually sessile at the base of the stems, the others terminal and sessile within the last leaves of the stems or their branches. Bracts very thin and transparent, broadly ovate or orbicular, nearly as long as the perianth. Perianth 2½ to nearly 3 lines long, the very short entire base or disk surrounded by a dense tuft of long articulate hairs sometimes as long as the perianth; segments 3-nerved in the lower half, the upper half or lamina scarious and rather broad towards the top, all glabrous or with very few hairs on the lower half chiefly marginal. Staminal cup very short, surrounded by woolly hairs proceeding from the base of the inner segments. Ovary glabrous. —*Trichinium humile*, Nees in Pl. Preiss. i. 628; Moq. in DC. Prod. xiii. ii. 288; *T. nanum*, F. Muell. Fragm. iii. 161.

W. Australia, *Drummond, n.* 121 or 175; York district, *Preiss, n.* 1363; Kalgan river, *Oldfield;* N. of Stirling Range, *F. Mueller;* W. or N.W. coast, *Bynoe.*

Var. *parviflora.* Small and slender but branching, with several spikes much narrower than in the typical form, the perianth-segments not 2 lines long and broader in proportion than in the type, with the opaque pink centre extending higher up, and the surrounding hairs shorter.—W. Australia, *Burgess.*

6. ACHYRANTHES, Linn.

Flowers hermaphrodite. Perianth-segments 5, slightly unequal, hardened after flowering and erect, enclosing the fruit, usually glabrous. Stamens 5, united in a cup at the base, with as many small scales or staminodia between them. Anthers 2-celled. Ovary uniovulate. Style simple, with a capitate stigma. Fruit a membranous indehiscent utricle enclosed in the perianth. Seed solitary.—Herbs. Leaves opposite. Flowers green and rigid or rarely scarious, reflexed, in terminal heads or long spikes. Bracteoles subulate, rigid and often spinescent.

The genus is widely distributed over the tropical and subtropical regions of the Old World. The only Australian species is a common weed over the whole range of the genus.

1. **A. aspera,** *Linn.; Moq. in DC. Prod.* xiii. ii. 314. An erect or spreading annual or biennial, with a hard almost woody base and branching stems of 2 or 3 ft., more or less hoary as well as the foliage with a soft pubescence. Leaves, shortly petiolate ovate, ovate-oblong or almost oblong, obtuse or shortly acuminate and acute, usually 1 to 2 in. but sometimes 3 in. long. Flowers of a shining green, in long slender but rigid terminal spikes. Perianth 1½ to nearly 2 lines long, closely reflexed after flowering. Bracteoles rigidly subulate or spinescent (but not spreading as in *Nyssanthes*), usually nearly as long as the perianth, but variable in length, dilated and scarious at the base.—Wight, Ic. Pl. t. 1777; *A. australis*, R. Br. Prod. 417; Moq. in DC. Prod. xiii. ii. 313.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* Goulburn islands, *A. Cunningham;* Victoria river, *F. Mueller;* Escape Cliffs, *Hulls;* Nichol Bay, N.W. coast, *Ridley's Expedition;* Port Darwin, *Schultz.*

Queensland. Broad Sound, *R. Brown;* Albany island, *F. Mueller;* Cape York, *Daemel;* Rockingham Bay, *Dallachy;* Rockhampton, a common weed, *O'Shanesy;* Nerkool Creek, *Bowman;* Moreton Bay, *Leichhardt, F. Mueller.*

N. S. Wales. Lord Howe's island, *M'Gillivray, Milne.*

A. canescens, R. Br. Prod. 417, Moq in DC. Prod. xiii. ii. 312, is a more pubescent or hoary villous variety, with thicker leaves and rather larger perianths, passing very gradually into the commoner forms; the most marked specimens are Brown's from the Carpentaria islands and F. Mueller's from Victoria river.

A. argentea, Lam; Moq. l.c. 315, is another variety or form only to be distinguished from the common one by the more acuminate leaves, but is not generally so common or so well marked in Australia as in Africa and in S. Europe. Some specimens, however, such as those of Schultz's from Port Darwin, are quite characteristic.

7. NYSSANTHES, R. Br.

Flowers hermaphrodite. Perianth-segments 4, of which 2 upper ones smaller, all hardened after flowering and erect, enclosing the fruit, all or the 2 outer ones more or less spinescent. Stamens 2 or 4, united in a cup at the base, with as many short scales or staminodia between them. Anthers 2-celled. Ovary uniovulate. Style with a capitate stigma. Fruit a membranous indehiscent utricle, enclosed in the perianth. Seed solitary.—Herbs. Leaves opposite. Flowers green

and rigid, very spreading or reflexed after flowering, in sessile head-like spikes or clusters, the bracts and bracteoles spinescent and very spreading.

The genus is limited to Australia, differing slightly from *Achyranthes* in its inflorescence, spreading bracts and constantly 4-merous flowers.

Stamens 4 . . . . 1. *N. erecta.*
Stamens 2 . . . . 2. *N. diffusa.*

1. **N. erecta,** *R. Br. Prod.* 418. Erect and probably 2 ft. high or more, the upper flowering portion with spreading opposite dichotomous branches, the whole plant more or less pubescent with soft appressed hairs. Leaves elliptical-oblong or almost lanceolate, mostly acute, contracted into a short petiole, those on the main stem and the lower floral ones 1 to 3 in. long, the upper floral ones very small. Flowers in dense clusters or short spikes sessile in the upper axils and forks of the panicle, each flower sessile within a spinescent bract shortly dilated and scarious at the base, and 2 similar but smaller bracteoles very divaricate on the fruiting perianth. Perianth with 2 outer segments about 1½ lines long but unequal, hairy, lanceolate, tapering into a rigid spinescent point, with 2 or 3 more or less conspicuous nerves on each side of the prominent midrib, the 2 inner ones smaller glabrous and scarcely nerved. Stamens 4, the filaments short, the intervening scales or staminodia broad, truncate, about half as long as the filaments. Fruit nearly globular, about ¾ line long, membranous except the depressed summit which is harder.—Moq. in DC. Prod. xiii. ii. 309.

Queensland, *Bowman;* Dawson and Brisbane rivers, *F. Mueller.*
N. S. Wales. Nepean river, *R. Brown;* New England, *C. Stuart.*

I have seen but few specimens. The perianths are usually but not always more thickened at the base and reflexed than in *N. diffusa.* The spinescent bracts and summits of the perianth segments are very variable in length and relative proportions, but they are usually, especially the bracteoles, shorter than in *N. diffusa.* The difference in the stamens appears to be constant.

2. **N. diffusa,** *R. Br. Prod.* 418. An annual or biennial closely allied to *N. erecta,* but usually more branched from the base, more slender, and the parts smaller. Stems attaining 1 to 3 ft., the greater portion consisting of a broad leafy panicle, the branches dichotomous or the lower ones trichotomous. Leaves ovate or oblong, obtuse or acute, rarely much above 1 in. and mostly small. Spikes or clusters of flowers very short, in the axils and in the forks of the panicle, the flowers usually smaller than in *N. erecta,* but the segments as well as the bracts and bracteoles even more variable in size and relative proportions than in that species; sometimes all three bracts are subulate almost from the base and 3 to 4 lines long, more frequently the bracteoles are much shorter, but all three very divaricate; one of the outer perianth-segments usually long, the other much shorter, both spinescent, the inner ones lanceolate and tapering into a shorter spine. Stamens always 2 only, with short broad truncate scales or staminodia between them.—

Moq. in DC. Prod. xiii. ii. 308; *N. media*, R. Br. Prod. 418; Moq. l.c. 309.

Queensland. Shoalwater Bay, *R. Brown*; Brisbane river, *F. Mueller*; Rockhampton, *Sutherland, O'Shanesy*; Nerkool Creek, *Bowman*.
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Leichhardt* and others; Clarence river, *Beckler*.

N. media, Br., appears to me to be rather a luxuriant state than a variety of *N. diffusa*.

8. ALTERNANTHERA, R. Br.

(Telanthera, *Moq.*)

Flowers hermaphrodite. Perianth divided to the base into 5 segments, all equal or the outer ones larger, ovate or lanceolate, scarious and coloured (usually white) glabrous or with long woolly hairs at the base. Stamens united at the base into a short exceedingly thin cup; filaments short with or without intervening teeth or lobes, unequal, 2 or 3 of them often without anthers and reduced to short teeth. Anthers small. Ovary uniovulate; style short sometimes scarcely any, with a capitate stigma. Fruit an indehiscent utricle usually compressed. Seed vertical.—Annual or perennial herbs, mostly prostrate, glabrous or softly hairy. Leaves opposite. Flowers small, in axillary sessile or pedunculate spikes (very rarely also terminal), usually short or oblong. Bracts and bracteoles scarious.

The genus is widely spread over the warmer regions of both the New and the Old World, including three of our common tropical weeds. Of the Australian species one is a common one in tropical Asia and Africa, another is closely allied to but perhaps not quite identical with a still more generally diffused species, the remaining six appear to be endemic, but the circumscription of the species as well as of the genus itself requires much further investigation. Moquin attributes to the whole genus (including *Telanthera*) 5 stamens with intervening staminodia (teeth or lobes of the staminal cup). In those species which he refers to *Alternanthera* proper, I can see no trace of these staminodia unless we consider as such the two or three out of the five filaments which are often reduced to small teeth. The extreme tenuity of the staminal cup renders it exceedingly difficult to ascertain its form, unless examined in the bud before the enlargement of the ovary.

Staminal cup without teeth between the filaments.
Perianth perfectly glabrous.
Plant glabrous or slightly pubescent at the nodes or in two decurrent lines. Leaves narrow.
Perianth-segments and bracteoles (above 1½ lines long) with fine points. Spikes at length several together in dense globular clusters . . . . 1. *A. nodiflora.*
Perianth-segments and bracteoles (1 line long or under) broad with short points. Spikes small, at length cylindrical and scarcely clustered . . . . 2. *A. denticulata.*
Plant more or less hairy or rarely glabrous. Leaves mostly broad. Rhachis of the spike woolly . . . . 3. *A. nana.*
Perianth-segments enveloped in long woolly hairs proceeding from the base (often concealed in the young spike by the bracteoles).
Bracteoles shorter than the perianth. Perianth-segments all equal (about 1 line long) and glabrous inside . . . . . . 4. *A. angustifolia.*

Bracteoles as long as the perianth. Perianth-segments 1½ to 2 lines long, the inner ones smaller and woolly inside at the base.
  Spikes all axillary, ovoid. Bracteoles and perianth-segments very acute. Anthers 5 . . . . 5. *A. decipiens.*
  Spikes terminal and axillary, globular. Bracteoles and perianth-segments scarcely mucronate. Anthers usually 3 . . 6. *A. polycephala.*
Staminal cup with prominent teeth or lobes between the filaments. Perianth-segments hairy on the back to above the middle. Leaves linear.
  Spikes axillary, shortly pedunculate, ovoid. Lobes of the staminal cup much shorter than the filaments . . . . 7. *A. leptophylla.*
  Spikes on long peduncles, globular. Lobes of the staminal cup rather longer than the filaments . . . . 8. *A. longipes.*

1. **A. nodiflora,** *R. Br. Prod.* 417. Stems prostrate, decumbent or ascending, 6 in. to 1 or even 2 ft. long, glabrous or slightly pubescent in decurrent lines. Leaves linear or lanceolate, shortly contracted at the base, 1 to 2 in. long. Spikes globular, about 4 lines diameter when fully out, but often clustered many together into dense globular masses sometimes above 1 in. diameter, interspersed with a few small floral leaves. Bracts, bracteoles and perianth-segments narrow, acuminate with fine points, usually about 1½ lines long or rather more. Stamens very short (about ¼ line), the filaments unequal, dilated at the base and united into a minute open cup, 2 or 3 bearing anthers, the others reduced to small teeth. Style distinct though very short. Utricle not half as long as the perianth, much compressed, broad, deeply notched with obtuse thickened margins.—Moq. in DC. Prod. xiii. ii. 356.

N. Australia. Sturt's Creek, *F. Mueller;* Victoria river, *Flood;* in the interior, *M'Douall Stuart's Expedition;* Albert river, *Henne.*
Queensland. Broad Sound, *R. Brown;* Armadilla, *Barton;* in the interior, *Mitchell.*
N. S. Wales. Gwydir river, *Leichhardt;* New England, *C. Stuart;* Ballandool river, *Locker;* Murray and Darling desert, *F. Mueller, Victorian Expedition.*
Victoria. Murray river, *F. Mueller;* Skipton, *Whan.*
S. Australia. S. of Wills' Creek, *Howitt's Expedition.*
W. Australia. *Drummond, n.* 220.

The species appears to be widely spread over E. India and Africa, but is not always easy to distinguish from *A. denticulata, A. sessilis,* and perhaps some others. The Australian specimens when first in flower are very much like those of *A. denticulata.* When fully developed the perianths and bracts are much longer and more acuminate, the fruit shorter in proportion and broader than in *A. denticulata,* and the notch, although variable, usually much deeper.

2. **A. denticulata,** *R. Br. Prod.* 417. Stems prostrate, creeping and rooting at the lower nodes, often extending to 2 or 3 ft. and shortly ascending, glabrous or minutely pubescent in decurrent lines. Leaves linear or linear-lanceolate, obtuse or mucronate, shortly contracted at the base, mostly ¾ to 1½ in. long. Spikes globular or at length ovoid or oblong, about ¼ in. diameter, closely sessile in the axils and sometimes 2 or 3 together but not so densely clustered as in *A. nodiflora,* usually quite glabrous. Perianth-segments under 1 line long, very acute though shorter pointed than in *A. nodiflora.* Stamens and style

entirely of that species. Utricle shorter than the perianth; compressed and broadly obcordate or truncate, but longer in proportion and less notched than in *A. nodiflora*, shorter in proportion than in *A. sessilis*.—Moq. in DC. Prod. xiii. ii. 356; *Illecebrum denticulatum*, Spreng. Syst. i. 820; *A. sessilis*, Br. *var.* Hook. f. Fl. Tasm. i. 310.

Queensland. Keppel Bay, *R. Brown;* Port Denison, *Fitzalan;* Rockhampton, *O'Shanesy;* Gilbert river, *Daintree;* Armadilla, *Barton;* Darling Downs, *Law.*
N. S. Wales. Hunter's river, *A. Cunningham;* Clarence river, *Beckler.*
Victoria. Emu Creek, *Whan.*
Tasmania. Port Dalrymple, *R. Brown;* near Launceston, *Gunn.*

Sometimes very difficult to distinguish from *A. nodiflora*, especially when first coming into flower, and on the other hand very near some varieties of the widely distributed *A. sessilis*, Br., with which J. D. Hooker, perhaps not incorrectly, unites it. In general it differs slightly in the narrower leaves, glabrous spikes, more acute flowers and shorter utricles.

Var.? *micrantha.* Smaller and more slender and sometimes slightly pubescent. Leaves linear, ½ to 1 in. long. Spikes 1½ lines diameter, with a few hairs on the rhachis. Perianth-segments ½ to ¾ line long, scarcely mucronate, the flowers very deciduous, leaving the bracts persistent.

N. Australia. Arnhem's Land, *F. Mueller.*

3. **A. nana,** *R. Br. Prod.* 417. Stems prostrate or ascending, loosely pubescent as well as the foliage, and often woolly at the nodes. Leaves oblong lanceolate or almost linear, obtuse or acute, tapering at the base and shortly petiolate, ¾ to 1½ in. long or in the broader leaved specimens under ¾ in. Spikes sessile in the axils, about ¼ in. diameter, at first depressed-globular but at length ovoid or shortly cylindrical, 4 to 5 lines long and very shining, the rhachis woolly. Perianth-segments oblong or lanceolate with a small point, thickened and hardened at the base when in fruit, 1¼ to above 1½ lines long, glabrous as well as the short bracts and bracteoles. Stamens very short, the filaments filiform or slightly dilated at the base, usually 3 bearing anthers and 2 reduced to small teeth. Utricle scarcely half so long as the perianth.—Moq. in DC. Prod. xiii. ii. 360; *Illecebrum nanum*, Spreng. Syst. i. 819.

N. Australia. Nicholson river and Sturt's Creek, *F. Mueller.*
Queensland. Broad Sound, *R. Brown;* Brisbane river, *F. Mueller.*
N. S. Wales. "Near Mr. Scott's and everywhere in the dry bed of the river," *Leichhardt;* New England, *C. Stuart;* Ballandool river, *Lockhardt.*

Var. *major.* Larger and more hairy, leaves longer, perianth-segments acute.—Rockhampton, *O'Shanesy.*

The species is very variable, especially as to the size of the flowers, and some specimens come very near some forms of *A. sessilis* but always with the utricle much shorter in proportion to the perianth. Brown's specimens as well as some of F. Mueller's and of Leichhardt's have the flowers much smaller than in the others.

4. **A. angustifolia,** *R. Br. Prod.* 417, *but not of Moq.* Prostrate, glabrous or slightly hoary-pubescent. Leaves linear in the typical form, above 1 in. long and much like those of *A. denticulata* or even narrower. Spikes sessile, solitary or rarely clustered, seldom above ¼ in. diameter and mostly smaller and very short, the rhachis more or less woolly. Bracts very acute, glabrous, shorter than the perianth.

Perianth-segments lanceolate, acute, 1 line long or a little more, with long woolly hairs outside; the inner ones narrower than the outer. Filaments short, only 3 bearing anthers, all dilated at the base. Stigma capitate, sessile in the flowers examined.—*Illecebrum angustifolium*, Spreng. Syst. i. 818.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Sturt's Creek, *F. Mueller.*

Var. *lanata.* More woolly. Leaves narrow-oblong, under ½ in. long. Spikes more woolly.—Arnhem's Land, *F. Mueller.*

5. **A. decipiens,** *Benth.* Apparently a small annual, the specimens under 6 in., branching and softly hirsute. Leaves ovate or ovate-lanceolate, rather acute, contracted into a rather long petiole. Spikes numerous, axillary, closely sessile, ovoid and about ¼ in. long in the specimens seen but still very young. Bracteoles 2 lines long, narrow and tapering into a fine point. Perianth of *A. polycephala*, but the segments narrower and tapering into fine points. Stamens all 5 perfect in the specimens examined. Ovary of *A. polycephala.*

Queensland? Subtropical Australia, *Mitchell* (*Herb. Hook.*).

This may possibly prove to be a variety of *A. polycephala*, but the long points to the bracteoles and perianth-segments give it the aspect of the *A. achyrantha*, Br., from which however it differs in the long hairs enveloping the perianth and other characters.

6. **A. polycephala,** *Benth.* A very much branched annual of 6 in. to 1 ft., the stems and foliage pubescent, or woolly when young. Leaves lanceolate, contracted into a petiole, rarely above ½ in. long. Spikes globular or ovoid, 4 to 5 lines diameter, sessile, axillary and terminal, so numerous as at length almost to conceal the leaves, the shining bracts at first, and later the wool very conspicuous; the rhachis woolly. Bracteoles glabrous, ovate, obtuse or slightly mucronate, as long as the perianth. Perianth enveloped in long silky-woolly hairs proceeding from its base, 1½ to 2 lines long, thin and transparent with the centre of the lower half of the segments opaque, the 3 inner segments smaller with long woolly hairs inside at the base. Filaments slender, united at the base into a very short cup partially adnate to the perianth, only 3 of them antheriferous as far as I could ascertain. Style about half as long as the ovary, with a capitate stigma. Utricle shorter than the perianth, compressed but rounded at the top and not notched.—*A. angustifolia*, Moq. in DC. Prod. xiii. ii. 354, not of R. Br.

N. Australia. Greville island, Regent's harbour, N.W. Coast, *Bynoe.*—The flowers are far advanced in the specimens, and I had great difficulty in ascertaining the structure of the staminal apparatus owing to its extreme tenuity and to the copious wool in which it is enveloped, but I believe the above account of it to be correct.

7. **A. leptophylla,** *Benth.* Stems slightly bifariously pubescent. Leaves narrow-linear, glabrous. Spikes ovoid (probably at length cylindrical) very shortly pedunculate in the axils, about ¼ in. diameter, the rhachis slightly woolly. Bracteoles obtuse, glabrous, nearly as long as the perianth, the bracts shorter. Perianth 1 to 1¼ lines long, the segments with long woolly hairs on the back, and short glabrous obtuse

white tips, all glabrous inside, the inner ones rather smaller. Filaments filiform, united in a short cup, all antheriferous, and alternating with short broad scale-like truncate or jagged teeth or lobes. Style longer than the ovary, with a capitate stigma. Utricle compressed but not notched.

N. Australia. Sturt's Creek, *F. Mueller*: a single small specimen in Herb. F. Mueller.

8.? **A. longipes,** *Benth.* An annual with slender erect slightly branched glabrous stems of about 1 ft. Leaves sessile, linear, acute, contracted at the base, slightly hairy, 1½ to 2 in. long, the younger ones hoary-villous. Spikes globular, about 4 lines diameter, solitary on filiform rigid peduncles of 1 to 2 in. Bracteoles ovate, acuminate, glabrous, hyaline, nearly as long as the perianth, bracts rather shorter. Perianth 1½ lines long, enveloped at the base in long flexuose hairs, the segments linear-lanceolate, acute, green in the centre, white on the margin. Filaments linear-subulate, alternating with subulate ligulate staminodia, rather longer than them and entire or jagged. *Telanthera longipes,* Moq. in DC. Prod. xiii. ii. 370.

N. Australia. N.W. Coast, *Bynoe*.—I have not seen the specimens, nor does it appear in what herbarium Moquin examined them. I have taken the above from his character and description.

9. GOMPHRENA, Linn.

(Philoxerus, *R. Br.*)

Flowers hermaphrodite. Perianth divided to the base into 5 segments, all equal or the outer ones rather larger, linear, scarious and coloured with the centre green at least at the base, woolly outside below the middle or glabrous. Stamens united at the base in a long or short tube, the free part of the filaments short, with or without intervening teeth or scale-like lobes; anthers 1-celled. Ovary uniovulate; style short or filiform, with 2 short, often minute, linear stigmatic lobes. Fruit an indehiscent utricle. Seed vertical.—Annual or perennial herbs, glabrous or with more or less of soft woolly hairs. Leaves opposite. Flowers in terminal or rarely axillary spikes usually dense, either shortened into globular or hemispherical heads or more or less lengthened ovoid-oblong or cylindrical. Bracts and bracteoles scarious, glabrous, the bracteoles more or less complicate and keeled. Ovary glabrous.

The genus comprises a considerable number of species, the extra-Australian ones all from the warmer regions of America, one of which, of early cultivation in gardens, is now a common weed in E. India. The Australian species appear to be all endemic.

The circumscription of the genus is in a very unsatisfactory state. If Moquin's technical characters were strictly followed, the Australian species would be distributed among at least four of his genera. It appears to me, however, that the presence or absence of the teeth or lobes of the staminal tube between the filaments is of no more value here than in the case of *Tricoinium*, and I have followed Brown in distinguishing *Gomphrena* from *Alternanthera* chiefly by the 2-lobed stigma. Moreover, the shortness of the staminal tube, by which Brown separated *Philoxerus*, can scarcely hold if

G. lanata, Br. (*G. Brownii*, Moq.) is to be retained in *Gomphrena*, and is at the best rather a sectional than a generic character.

Staminal tube longer than the ovary. Spikes globular or ovoid, usually large. Filaments flat. Leaves linear.
Staminal tube with filiform teeth between the filaments. Spikes globular. Perianth-segments acute. Annual . . . . . 1. *G. canescens.*
Staminal tube without teeth or lobes between the filaments.
Annual of 1 to 2 ft. Spikes at length ovoid or oblong. Perianth-segments obtuse . . . . 2. *G. flaccida.*
Annual under 1 ft. Spikes hemispherical or globular. Perianth-segments acute . . . . 3. *G. affinis.*
Perennial under 1 ft. Spikes hemispherical or globular. Perianth-segments rather obtuse . . . . 4. *G. humilis.*
Staminal tube shorter than the ovary. Spikes rarely above ¼ in. diameter.
Spikes hemispherical or globular. Perianth very woolly outside below the middle.
Staminal tube with teeth or lobes between the filaments.
Leaves linear. Bracts much shorter than the bracteoles . 5. *G. Brownii.*
Leaves lanceolate. Bracts nearly as long as the bracteoles 6. *G. brachystylis.*
Staminal tube without teeth or lobes between the filaments.
Leaves broadly lanceolate. Filaments with a minute tooth at the top on each side . . . . 7. *G. leptoclada.*
Leaves narrow-lanceolate. Filaments filiform at the top without lateral teeth.
Spikes ½ in. diameter or more. Perianth woolly to above the middle. Bracteoles shorter than the perianth . . 8. *G. Maitlandi.*
Spikes 4 to 5 lines diameter. Perianth woolly only below the middle. Bracteoles longer than the perianth 9. *G. pusilla.*
Leaves filiform. Spikes and perianth of *G. pusilla* . . 10. *G. tenella.*
Spikes ovoid or oblong-cylindrical. Perianth woolly below the middle.
Spikes 5 lines diameter. Leaves all linear. Filaments broad and 2- or 3-toothed at the end . . . . 11. *G. conica.*
Spikes 3 or 4 lines diameter, densely crowded with broadly-lanceolate floral leaves. Filaments tapering at the end . 12. *G. conferta.*
Spikes at length narrow-cylindrical. Perianth small, quite glabrous.
Leaves hairy, lanceolate or oblong . . . . 13. *G. diffusa.*
Leaves glabrous or nearly so, narrow-linear . . . . 14. *G. parviflora.*

1. **G. canescens,** *R. Br. Prod.* 416. An erect more or less branching annual, usually stout and hard, 1 to nearly 2 ft. high, more or less hoary with long soft hairs, the older parts rarely glabrous. Leaves linear or linear-lanceolate, acute, the larger ones 2 to 3 in. long, the margins usually recurved. Spikes globular, sessile between the last leaves, about 1 in. diameter, the rhachis thick, ovoid or globular, woolly. Bracts and bracteoles thinly scarious, lanceolate, acute, about 3 lines long. Perianth-segments about 5 lines long, narrow, acute, 1-nerved, slightly woolly on the back below the middle, glabrous inside. Filaments united in a tube variable in length but always much longer than the ovary, the free portion short, flattened, with intervening filiform teeth or lobes, sometimes as long as the anthers, but often shorter. Style filiform.—Moq. in DC. Prod. xiii. ii. 398; *Philoxerus canescens*, Poir. Dict. Suppl. iv. 393.

N. Australia. Mainland of the Gulf of Carpentaria, *R. Brown*, *Henne*; Depuch island, N.W. coast, *Bynoe;* Nickol Bay, *Gregory's and Ridley's Expeditions;* Victoria river and Sturt's Creek, *F. Mueller;* Goulburn islands, *A. Cunningham;* Port Darwin and several other points along the coast, *Schultz* and others; Attack Creek in the interior, *M'Douall Stuart's Expedition.*

2. **G. flaccida,** *R. Br. Prod.* 416. An erect annual of 1 to 1½ ft., simple or branched, usually more slender than *G. canescens*, but sometimes as stout, the young parts woolly, becoming at length nearly glabrous. Leaves linear or linear-lanceolate, 1 to 2 in. or rarely longer, those under the spike much smaller. Spikes at first globular but soon becoming ovoid, solitary or 2 or 3 in a close cluster at the ends of the branches, about ¾ in. diameter and sometimes at length nearly 1 in. long, the rhachis woolly. Bracts 2½ to 3 lines long, the bracteoles much complicate and keeled. Perianth about 4 lines long, much flattened when old, the segments rather obtuse, slightly woolly outside near the base. Staminal tube varying in length as in *G. canescens*, and always longer than the ovary, the filaments shortly free and flattened but without the intervening teeth of that species.—Moq. in DC. Prod. xiii. ii. 398; *Philoxerus flaccidus*, Poir. Dict. Suppl. iv. 392; *G. firma*, F. Muell. Fragm. iii. 123.

N. Australia. Arnhem N. Bay, *R. Brown;* Regent's river and Cambridge Gulf, N.W. coast, *A. Cunningham;* Usborne harbour, *Voyage of the Beagle;* Victoria river, *Bynoe, F. Mueller;* Glenelg river, *Martin;* Port Essington, *Armstrong;* Port Darwin, *Schultz.*

Queensland. Cape York, *Daemel.*

The filaments are often broad and sometimes irregularly jagged or toothed towards the end, but different in different flowers of the same specimen, and not regularly 3 toothed as described by Moquin in the genus generally, and in this and other species specially.

3. **G. affinis,** *F. Muell. Herb.* An erect rigid much-branched annual, under 1 ft. high, hoary with silky-woolly hairs. Leaves linear or linear-lanceolate, with recurved margins, ¾ to 1½ in. long. Spikes sessile within the last pair of leaves, hemispherical or at length globular, ¾ in. diameter or rather more. Bracts and bracteoles very acute or almost aristate, nearly as long as the perianth. Perianth-segments acute, 4 to 5 lines long, very woolly to above the middle. Staminal tube longer than the ovary, the filaments broad, obtuse or truncate, with the anther on a minute central tooth, without any teeth between the filaments.

N. Australia. Upper Victoria river, *F. Mueller.*

4. **G. humilis,** *R. Br. Prod.* 416. A perennial, with a woody stock often bearing tufts of wool, the stems erect, branching, 6 to 9 in. high, glabrous as well as the foliage or with a few silky-woolly hairs, especially about the nodes. Leaves narrow-linear, mostly 1 to 1½ in. long, with smaller ones often clustered in the axils. Spikes depressed, almost hemispherical, ½ to 1 in. diameter, mostly pedunculate above the last leaves, or rarely with a pair of small leaves close under them, the rhachis woolly. Bracts and bracteoles glabrous, very thin and transparent, finely 1-nerved, the bracteoles usually about 2 lines long, broad and rather obtuse, the bracts smaller narrower and more acute, but both

variable. Perianth-segments 3 to 4 lines long, pink, rather broad, obtuse or scarcely acute, woolly outside to above the middle. Staminal tube longer than the ovary, usually bearing a few woolly hairs outside, the filaments lanceolate, acuminate, broad or narrow, without intervening teeth.—Moq. in DC. Prod. xiii. ii. 418; *Philoxerus humilis*, Poir. Dict. Suppl. iv. 392.

N. Australia. Albert river, *Henne.*
Queensland. Broad Sound, *R. Brown*; Port Denison, *Fitzalan*; Suttor and Bowen rivers, *Bowman.*

5. **G. Brownii,** *Moq. in DC. Prod.* xiii. ii. 397. An erect branching annual of 6 to 9 in., hoary with rather long silky or woolly hairs. Leaves linear, mostly $\frac{3}{4}$ to 1 in. long, acute and soft. Spikes globular or depressed, 4 to 5 lines diameter, sessile or very shortly pedunculate within the last leaves, or pedunculate in the upper axils without floral leaves. Bracteoles transparent, rather broad, acute, as long as the perianth or rather longer, the bracts much shorter. Perianth-segments scarcely $1\frac{1}{2}$ lines long, acute, with a narrow opaque centre, densely woolly outside with long hairs. Staminal tube not longer than the ovary though not much shorter, the filaments short, with oblong or lanceolate entire or denticulate teeth or lobes between them as long as the anthers.—*G. lanata*, R. Br. Prod. 416, not of Poir; *Philoxerus lanatus*, Poir. Dict. Suppl. iv. 392; *Alternanthera Baueri*, Moq. in DC. Prod. xiii. ii. 354.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown.*
Queensland. Suttor river, *Bowman.*

6. **G. brachystylis,** *F. Muell. Fragm.* iii. 124. Stems branching, above 1 ft. long, clothed as well as the foliage with soft woolly hairs. Leaves sessile, lanceolate or linear-lanceolate, acute, soft, the margins undulate or flat and not recurved, $\frac{1}{2}$ to 1 in. long. Spikes globular, about $\frac{1}{2}$ in. diameter, sessile between the last leaves or here and there on long peduncles without floral leaves. Bracteoles mucronate-acute, rather longer than the perianth; bracts but little shorter. Perianth-segments 2 to $2\frac{1}{2}$ lines long, densely covered outside with long woolly hairs, the glabrous tips very pale pink. Staminal tube shorter than the ovary, the filaments flat but narrow, acuminate, with long anthers; the intervening teeth or lobes as long as the filaments but broader and denticulate at the end. Style rather short.

N. Australia. Hooker's Creek, *F. Mueller.*

7. **G. leptoclada,** *Benth.* A slender much-branched annual, of 6 in. to 1 ft., the young plants densely clothed with white woolly hairs, the older stems glabrous and red. Leaves sessile, broadly or narrow lanceolate, acute, green above with rather long straight hairs, white underneath with woolly hairs, the lower ones $\frac{1}{2}$ to 1 in. long, the upper ones smaller. Spikes globular or depressed, 4 to 5 lines diameter, sessile between the last pair of leaves or here and there on long peduncles without floral leaves. Bracteoles white, very acute, about as long

as the perianth, the bracts rather shorter. Perianth-segments scarcely 2 lines long, with long woolly hairs outside at the base, the upper half glabrous and bright pink. Staminal tube shorter than the ovary, the filaments rather broad, minutely 3-toothed at the apex, the anther borne on the rather larger central tooth; no teeth or lobes to the tube between the filaments. Style short.

N. Australia. Glenelg district, N.W. coast, *Martin.*

8. **G. Maitlandi,** *F. Muell. Fragm.* iii. 124. *t.* 23. An erect branching annual of about 6 in., more or less woolly, the older leaves nearly glabrous. Leaves lanceolate or narrow-oblong, obtuse or acute, contracted at the base and sometimes shortly petiolate, ½ to 1½ in. long. Spikes depressed-globular, ½ to nearly ¾ in. diameter, sessile or shortly pedunculate above the last leaves. Bracts and bracteoles rather broad, very acute, nearly as long as the perianth. Perianth-segments about 2 lines long, acute, rather unequal, densely clothed outside to above the middle with long woolly white or ferruginous hairs. Staminal tube shorter than the ovary, without teeth or lobes between the filaments.—*Iresine Cunninghamii*, Moq. in DC. Prod. xiii. ii. 342.

N. Australia. Dampier's Archipelago, N.W. coast, *A. Cunningham;* Pyramid hill, Nichol Bay, *F. Gregory's Expedition.*

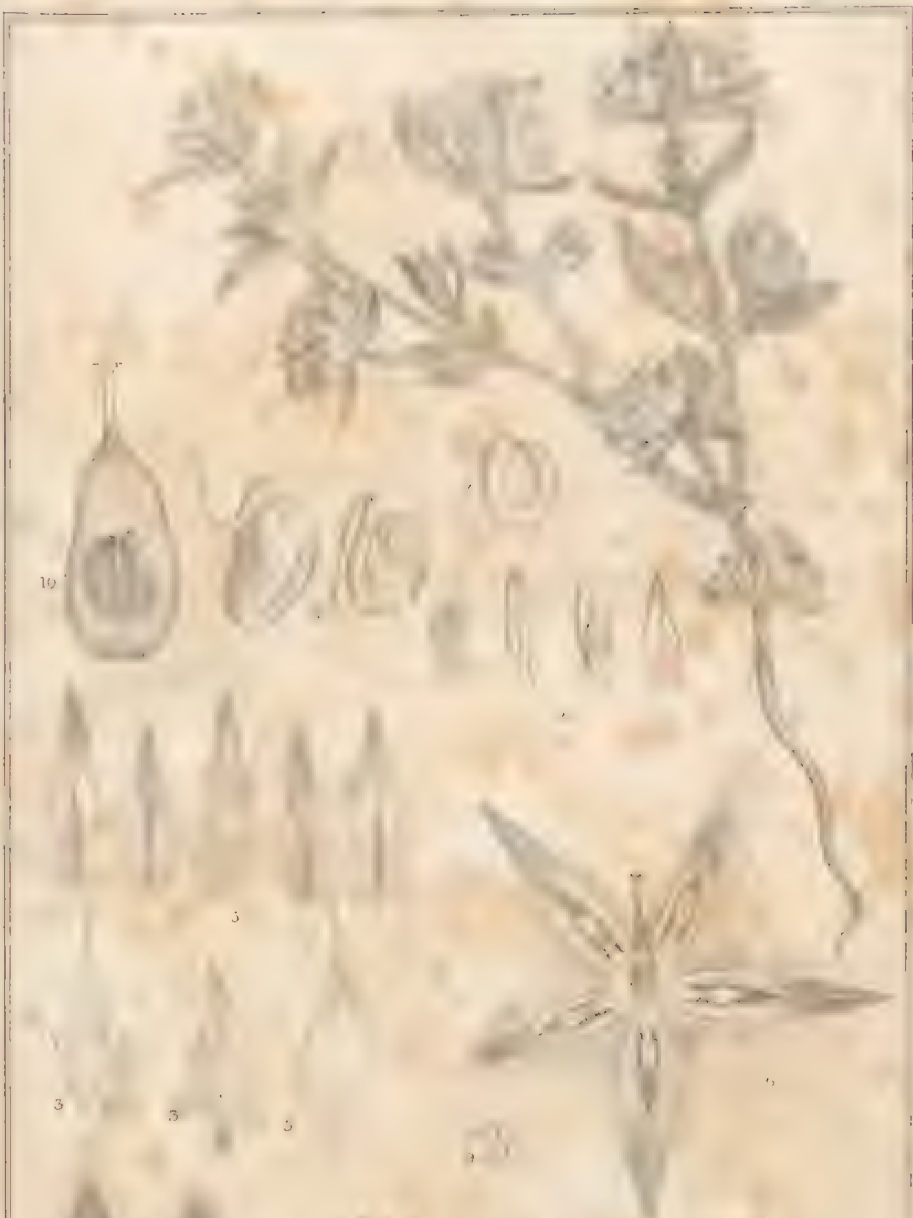
9. **G. pusilla,** *Benth.* A slender branching annual, under 6 in. high, with the loose wool, linear-lanceolate leaves and globular sessile spikes 4 to 5 lines in diameter of *G. Brownii.* Bracteoles acute, longer than the perianth, bracts rather shorter. Perianth-segments scarcely above 1½ lines long, woolly outside below the middle, the upper half scarious and white, the outer ones very obtuse, the inner ones narrower. Staminal tube very short and truncate, the filaments slightly dilated, not toothed at the end, and without intervening teeth or lobes.

N. Australia. Foul Point, N.W. coast, *Voyage of the Beagle.*

10. **G. tenella,** *Benth.* A very slender branching annual of ½ to 1 ft., glabrous or slightly woolly under the spikes. Leaves filiform, acute, 1 to 2 in. long. Spikes globular, 4 to 5 lines diameter, on slender peduncles. Bracteoles acute, about as long as the perianth, bracts shorter. Perianth-segments 1½ lines long, with long woolly hairs outside near the base, the upper half glabrous white and scarious, the green centres reaching to about ⅔ of the segment, the inner segments smaller and narrower. Staminal tube or cup very short; truncate, the filaments rather short, scarcely dilated, without intervening teeth or lobes. Style very short.—*Iresine tenella*, Moq. in DC. Prod. xiii. ii. 343.

N. Australia. Cygnet Bay, *A. Cunningham;* Foul Point, N.W. coast, *Voyage of the Beagle.*

11. **G. conica,** *Spreng. Syst.* i. 824. An erect branching annual of 1 to 1½ ft. with the aspect of *G. flaccida*, slightly hoary woolly or glabrous. Leaves linear, with recurved margins, 1 to 2 in. long. Spikes at first ovoid, at length cylindrical, about 5 lines diameter and attain-



Gomphrena Maitlandii.

ing nearly 1 in. in length, pedunculate and solitary, or (in R. Brown's specimens) frequently in clusters of 2 or 3 and more conical. Bracts and bracteoles acute, scarcely half as long as the perianth. Perianth-segments 2½ to 3 lines long, covered outside with long dense wool, with white obtuse glabrous tips. Staminal tube or cup shorter than the ovary; filaments broad, 2-toothed with the anther sessile between the teeth, without intervening lobes or teeth to the cup. Style short.—*Philoxerus conicus*, R. Br. Prod. 416; *Iresine conica*, Moq. in DC. Prod. xiii. ii. 342; *Gomphrena breviflora*, F. Muell. Fragm. iii. 125.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Upper Victoria river and Sturt's Creek, *F. Mueller*; Lara station, *Kennedy*.

12. **G. conferta,** *Benth.* Erect hard stout and probably tall, but apparently annual, the specimens very imperfect, the branches bearing a few white woolly hairs and linear or linear-lanceolate leaves of 1 to 2 in. Spikes ovoid or cylindrical, 3 to 4 lines diameter and some of them above ½ in. long, sessile and crowded on very short axillary branchlets and surrounded by broadly lanceolate herbaceous softly villous floral leaves about as long as the spikes. Bracteoles very broad and obtuse, rather longer than the perianth; bracts shorter and more acute. Perianth-segments scarcely 1½ lines long, woolly outside to above the middle, the glabrous white tips very obtuse in the outer ones, less so and narrower in the inner. Staminal tube short; filaments dilated at the base, acuminate, without intervening teeth or lobes. Style short.—*Iresine macrocephala*, Moq. in DC. Prod. xiii. ii. 342.

N. Australia? Victoria river? *Bynoe*.
Queensland. Cape Flinders, *A. Cunningham*.

13. **G. diffusa,** *Spreng. Syst.* i. 824. Stems from a perennial often woody stock procumbent, branching, slender, 1 to 2 ft. long, the branches and foliage softly pubescent. Leaves lanceolate, acute, contracted into a very short petiole, ½ to 1 in. long. Spikes axillary, shortly pedunculate, at first ovoid or oblong but lengthening to ½ or ¾ in. and not ¼ in. diameter, the rhachis pubescent. Bracts and bracteoles obtuse, as long as the perianth, the bracteoles broad and readily splitting. Perianth-segments about 1 line long, quite glabrous, obtuse, scarious with a narrow opaque centre not reaching either to the summit or to the base. Staminal tube rather shorter than the ovary; filaments short, much dilated, tapering to a point, without intervening teeth or lobes.—*Philoxerus diffusus*, R. Br. Prod. 416; *Iresine Brownii*, Moq. in DC. Prod. xiii. ii. 341.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*.

This and the following species have the habit almost as much of *Alternanthera* as of *Gomphrena*, but the style is decidedly lobed.

14. **G. parviflora,** *Benth.* Stems long and slender, probably diffuse, turning red, the whole plant quite glabrous or with a few long hairs on the young shoots. Leaves sessile, linear or linear-lanceolate, acute, with recurved margins, ½ to 1 in. long. Spikes pedunculate,

axillary and terminal, quite glabrous, about 2 lines diameter, at first short and conical, at length cylindrical and ½ in. long. Bracts short broad and persistent, bracteoles erect, more than half as long as the perianth and deciduous with it. Perianth-segments quite glabrous, scarcely 1 line long, obtuse, white, shortly green at the base. Staminal tube shorter than the ovary, truncate; filaments but slightly dilated, without intervening teeth or lobes. Style very short.

N. Australia. Regent river N.W. coast, *A. Cunningham*; Port Darwin, *Schultz*.

ORDER XCVIII. PARONYCHIACEÆ.

Perianth-segments or lobes 5, rarely 4 or 3, usually scarious at the margins, imbricate in the bud. Stamens as many as perianth-segments and opposite to them or fewer by abortion, with or without intervening teeth lobes or staminodia, usually filiform, rarely petal-like or perfect stamina. Ovary 1-celled with 1 ovule attached to a funicle erect from the base of the cavity. Style more or less divided into 2 or 3 branches or separate styles, stigmatic at the end or along the inner edge. Fruit a membranous indehiscent utricle enclosed in or resting on the persistent perianth. Seed usually vertical, orbicular or ovate and compressed; testa crustaceous or membranous. Embryo curved or annular, enclosing a mealy albumen.—Herbs usually small and much branched. Leaves opposite or rarely alternate, entire, accompanied by small scarious stipules or connected by a raised line or narrow membrane. Flowers small, in axillary or terminal cymes, sometimes reduced to dense clusters or rarely solitary. Bracts small, usually scarious; bracteoles only under solitary flowers or the terminal flower of the cymes.

A small Order, widely dispersed over the temperate and cooler regions of the globe, more rare within the tropics and there chiefly in mountainous or sandy districts. The only Australian genus is common to both the northern and southern extratropical regions of the Old World. The Order is undistinguishable from Amarantaceæ by any positive character, differing chiefly in the stipules or connecting lines of the leaves like those of Caryophylleæ. The teeth or lobes intervening between the stamens (staminodia), which in Amarantaceæ are exceedingly thin and transparent, are in Paronychiaceæ very various, sometimes thin and transparent, sometimes firm or developed into stamens (in the European *Scleranthi*) or into petals (in *Corrigiola*); in both Orders they are frequently deficient.

1. SCLERANTHUS, Linn.

(Mniarum, *Forst.*)

Perianth-tube as long as the lobes, somewhat enlarged and hardened after flowering. Stamens 5 or fewer, opposite the lobes, connected by a membrane or raised line at the mouth of the perianth-tube, with or without intervening teeth or filaments, or in species not Australian perfect stamens. Styles 2, slender. Fruit a membranous utricle enclosed in the perianth-tube.—Small densely branched herbs. Leaves opposite, narrow, connected by a raised line or sheathing membrane,

without stipules. Flowers solitary or several together, sessile or nearly so within a pair of scarious bracts at the end of axillary peduncles.

The genus is represented by a few species in Europe, temperate and subtropical Asia and northern Africa. Of the four Australian species one is also in New Zealand, the three others are endemic. The specimens of this genus from the Melbourne herbarium have been accidentally omitted from those sent over to me for examination, but have been fully described by F. Mueller in the Plants of the Colony of Victoria, i. 214 to 216.

Leaves narrow-linear, not pungent. Flowers green, not above 1 line long.
  Flowers solitary. Stamen 1 . . . . 1. *S. mniaroides.*
  Flowers 2 together. Stamen 1 . . . . 2. *S. biflorus.*
  Flowers several together. Stamens 2 . . . . 3. *S. diander.*
Leaves rather broader, rigid and pungent-pointed. Flowers scarious, 2 lines long, 2 or several together. Stamens 5, with intervening filaments . . . . 4. *S. pungens.*

1. **S. mniaroides,** *F. Muell. Pl. Vict.* i. 215, t. 12. A perennial with densely branched decumbent stems of 3 to 4 in., resembling *S. biflorus* both in habit and foliage. Leaves linear, scarcely acute, entire, 2 to 4 lines long. Peduncles at first very short, longer than the leaves when in fruit as in *S. biflorus*, but never bearing more than a single flower, which is sessile between 2 minute broad concave bracts. Perianth scarcely above ½ line long when in flower, nearly 1 line when in fruit, the tube then ovoid and thickened, crowned by 4 or 5 short herbaceous lobes not enlarged. Stamen 1, inserted opposite one of the lobes in a notch in an annular membrane at the mouth of the tube. Fruit of *S. biflorus.*—*Mniarum singuliflorum*, F. Muell. in Trans. Phil. Soc. Vict. i. 13 and in Hook. Kew. Journ. viii. 69.

Victoria. Glacier ranges of the Australian Alps, not descending below 5000 ft., *F. Mueller.*

2. **S. biflorus,** *Hook. f. Fl. N. Zeal.* i. 74 *and Fl. Tasm.* i. 42. A low tufted perennial, with short decumbent stems forming dense masses of a few inches diameter or rarely looser and lengthening to 6 in., glabrous or with a minute pubescence on the branches. Leaves crowded, narrow-linear, acute, entire or minutely scabrous, serrulate, mostly 3 to 4 lines long. Peduncles axillary, at first very short and sometimes remaining so, but more frequently lengthening before or after flowering and exceeding the leaves when in fruit, each bearing 2 small flowers sessile within a pair of ovate acute concave bracts, and one of the flowers (the latest in expanding) with a pair of smaller bracteoles. Perianth when in flower ½ to ¾ line long, with 4 or 5 herbaceous lobes and a single stamen opposite one of the lobes inserted in a scarcely prominent annular membrane at the mouth of the tube. Fruiting perianth nearly 1 line long, the hardened tube ovoid, almost closed by the staminal membrane, crowned by the unenlarged persistent lobes and enclosing the membranous utricle.—F. Muell. Pl. Vict. i. 214, *Ditoca muscosa*, Banks in Gærtn. Fr. ii. 196, t. 126; *Mniarum biflorum*, Forst. Gen. 2, t. 1; R. Br. Prod. 412; DC. Prod. iii. 378; *M. pedunculatum*, Labill. Pl. Nov. Holl. i. 8, t. 2.

N. S. Wales. Blue Mountains, *Miss Atkinson*; Ben Lomond, Mount Mitchell and sources of Clarence river, *Beckler*, (*F. Mueller*), I have seen none of these specimens.

Victoria. Abundant on the alpine and subalpine plateaux and valleys throughout the chain of the snowy alps, descending to 3000 or rarely to 2000 ft., *F. Mueller*.

Tasmania. Port Dalrymple, *R. Brown*; common on dry grassy pastures on stones, &c., *J. D. Hooker*.

The species is also in New Zealand. *Mniarum fasciculatum*, R. Br. Prod. 412, Hook. Ic. Pl. t. 283, DC. Prod. iii. 378, or *Scleranthus fasciculatus*, Hook. f. Fl. Tasm. i. 42, appears to be rather a state of the plant with the peduncles remaining shorter than the leaves than a distinct variety.

3. **S. diander,** *R. Br. Prod.* 412. A perennial with a densely tufted almost woody stock and much branched erect or decumbent stems of 2 to 4 in. Leaves crowded, linear, very acute but not pungent, 2 to 3 lines long. Flowers several together, sessile in little heads shortly pedunculate in the upper axils or at the end of the branches. Bracts very acute, the outer ones leafy often longer than the flowers, the inner ones smaller, one to each flower or 2 to the terminal one of each branch of the head or cyme. Perianth about 1 line long, with 5 obtuse scarious lobes as long as the tube, slightly enlarged in fruit. Stamens 2, the filaments slightly dilated, the connecting membrane irregular or obsolete.—DC. Prod. iii. 378; Hook. f. Fl. Tasm. i. 42; F. Muell. Pl. Vict. i. 215.

N. S. Wales. Argyle County, *Backhouse*.

Victoria. Subalpine meadows through most ramifications of the Australian alps, *F. Mueller*.

Tasmania. Port Dalrymple, *R. Brown*; dry banks, pastures, &c., Launceston, *Gunn*.

F. Mueller mentions a desert variety flowering the first year, along the Murray and Wimmera rivers and Lake Alexandrina, which I have not seen.

4. **S. pungens,** *R. Br. Prod.* 412. A densely tufted or much-branched perennial, larger and more rigid than any other species, attaining 6 in. Leaves very rigid and pungent-pointed, linear or linear-lanceolate, ¼ to ½ in. long. Peduncles in the upper axils or terminal, very short, bearing a head of several sessile flowers. Bracts lanceolate, pungent-pointed, shorter than the flowers. Perianth about 2 lines long, the lobes lanceolate, very acute, longer than the tube, scarious at least at the margin. Stamens 5, the filaments filiform, opposite the perianth-lobes and alternating with as many filiform or flattened staminodia as long as the stamens. Ovary tapering into a rather long beak.—DC. Prod. iii. 378; F. Muell. Pl. Vict. i. 216.

Victoria. Barren ridges and wastes of the north-western district, *F. Mueller*.

S. Australia. Memory Cove, *R. Brown*; Murray Scrub, Flinders' Range and Spencer's Gulf, *F. Mueller*.

W. Australia? King George's Sound, *Herb. Hooker.*, but possibly some mistake in the station.

I have not seen any of F. Mueller's specimens.

ORDER XCIX. POLYGONACEÆ.

Perianth-segments 6, 5 or fewer, free or shortly united at the base, imbricate in the bud and more or less in 2 rows, regular and equal or the inner ones enlarged. Stamens variable in number, usually 9, 8, 6 or fewer, alternate with the perianth-segments or having no definite relation to them; anthers with 2 parallel cells. Ovary free, with a single erect orthotropous ovule. Styles or style-branches 2, 3 or rarely more, the stigmas terminal, capitate or dilated, entire or fringed. Fruit a small seed-like nut, usually with as many angles as styles, enclosed in or scarcely protruding from the persistent perianth. Seed erect with a membranous testa. Embryo in a mealy albumen, straight and central or more frequently curved and lateral: radicle superior.—Herbs shrubs woody climbers or rarely, in species not Australian, trees. Leaves alternate. Stipules usually thin and scarious, brown or silvery, forming a sheath or ring round the stem. Flowers small, herbaceous or coloured, clustered in the axils of the leaves, or within small sheathing bracts or even without bracts along the rhachis of simple or paniculate spikes or racemes, without bracteoles on the pedicels.

A considerable Order dispersed over every part of the globe. Of the four Australian genera, two have a very wide distribution especially in temperate regions of both the New and the Old World, another extends through New Zealand to Antarctic and Andine America, the fourth belongs to the Mediterranean and South African regions of the Old World, and may possibly be of recent introduction into Australia.

Perianth-segments 6, the 3 inner ones closing over the fruit. Stamens 6. Styles 3. Stigmas fringed.
  Fruiting perianth hard, with a 3-angled tube, the outer segments spreading and spinescent, the inner short and erect . . . . 1. EMEX.
  Fruiting perianth with the outer segments small and recurved, the inner enlarged and closed over the fruit . . . . 2. RUMEX.
Perianth-segments 5, nearly equal. Stamens 8 or fewer.
  Flowers mostly hermaphrodite. Styles or style-branches 2 or 3; stigmas entire . . . . 3. POLYGONUM.
  Flowers more or less diœcious. Styles or style-branches 3; stigmas more or less fringed, or rarely entire . . . . 4. MUHLENBECKIA.

1. EMEX, Necker.

Flowers monœcious. Male fl.: Perianth-segments 5, equal, spreading. Stamens 4 to 6. Pistil rudimentary. Female fl.: Perianth with a triangular turbinate tube and 6 lobes, enlarged and hardened in fruit, the 3 outer lobes corresponding to the angles of the tube rigid spreading and spinescent, the three inner ovate erect and connivent over the fruit. Ovary small, 3-angled, styles 3, short, with large fringed stigmas.—Herbs. Leaves ovate. Stipules brown and scarious, sheathing but soon loose and torn or jagged. Flowers in whorl-like clusters, the females axillary, the males distant on axillary peduncles, the lower clusters including sometimes a few females.

Besides the Australian species, which is identical with a South African one and perhaps introduced from thence, there is one other closely allied to it from the Mediterranean region of the northern hemisphere.

1. **E. australis,** *Steinh. in Ann. Sc. Nat. Ser.* 2, ix. 195, *t.* 7. Stems diffuse, rather thick, 1 to 1½ ft. long, glabrous as well as the whole plant. Leaves on long petioles, broadly ovate, very obtuse, truncate or broadly cordate at the base, 1 to 2 in. long. Fruiting perianth very hard, triquetrous, 4 to 5 lines long, with 3 rather long rigid thick spinescent and divaricate lobes, the three inner ones short, broad, erect, obtuse or mucronate.—Miq. in Pl. Preiss. i. 625; Meissn. in Linnæa xxvi. 363; *E. centropodium*, Meissn. in Linnæa xiv. 490, in Pl. Preiss. ii. 273, and in DC. Prod. xiv. 40.

S. Australia. Near Adelaide and Holdfast Bay, *F. Mueller.*

W. Australia, *Drummond, 2nd. coll. n.* 290; *Preiss, n.* 1895.

A common maritime plant in S. Africa, differing slightly from the Mediterranean species (*E. spinosa*, Campd.) in the larger fruiting perianth less rugose, the spinescent segments longer, and the inner erect ones broader and more rounded.

2. RUMEX, Linn.

Flowers hermaphrodite or unisexual. Perianth of 6 segments, the three inner ones enlarged after flowering and closing over the fruit, the three outer much smaller narrow and recurved. Stamens 6. Styles 3, shortly filiform, with large fringed stigmas. Nut triangular, enclosed in the persistent perianth. Embryo lateral, the radicle superior.—Herbs or rarely, in species not Australian, shrubs, usually glabrous. Flowers small, herbaceous or the males petal-like, all often turning red, usually on recurved pedicels, in whorl-like clusters, either axillary or in terminal racemes or panicles. Stipules sheathing, scarious, usually brown, at first entire but almost always very soon torn or jagged.

A considerable genus, widely distributed over most parts of the globe, but more especially in temperate regions, and a few species are amongst the roadside weeds which the most readily establish themselves in new countries. Of the 8 species here enumerated, three are certainly and a fourth possibly introduced from Europe or South Africa, the remaining four appear to be endemic.

Flowers all or mostly hermaphrodite.
Inner perianth-segments with entire margins, one or all bearing a tubercle on the midrib.
Inner perianth-segments broad, mostly cordate. Panicle dense with short crowded branches . . . . 1. *R. crispus.*
Inner perianth-segments narrow. Panicle with elongated branches, the clusters of flowers distant . . . . . . 2. *R. conglomeratus.*
Inner perianth-segments bordered by long teeth.
Flower-clusters distant along the branches, without floral leaves except to the lower ones.
Teeth of the inner perianth-segments five, with revolute points . . . . 3. *R. Brownii.*
Teeth of the inner perianth-segments rigid and straight or rarely curved at the point . . . . 4. *R. pulcher.*
Floral leaves all longer than the flowers.
Panicle very much divaricately branched. Clusters few-flowered. Fruiting perianth rather large, without tubercles . . . . 5. *R. dumosus.*

Branches erect. Flowers numerous and very small in dense clusters. Fruiting perianth small, with a tubercle on each segment . . . . 6. *R. halophilus.*
Flowers monœcious. Stems mostly simple, the upper clusters males, often without floral leaves, the lower clusters females, mostly axillary . . . . 7. *R. bidens.*
Flowers diœcious. Small plant, with narrow leaves mostly sagittate. Stipules silvery-shining . . . . 8. *R. acetosella.*

Besides the above, I find reference to a *Rumex crystallinus*, as described by Lange in the Index of seeds of the Garden of Copenhagen for the year 1861, from plants raised from seeds received from F. Mueller. I have been unable to find a copy of the seed-catalogue for that year, and am quite unacquainted with the plant in question, which, if really Australian, is probably identical with some one of those above enumerated.

1. **R. crispus,** *Linn.; Meissn. in DC. Prod.* xiv. 44. A perennial with a thick rhizome, and erect furrowed stems 2 to 3 ft. high, the branches few and short. Radical leaves narrow, usually 6 to 8 in. long, much undulate and crisped at the edges, the upper ones smaller, passing gradually into bracts. Flower-clusters numerous, and when in fruit much crowded into a long narrow and dense terminal panicle. Inner segments of the fruiting perianth broadly ovate, entire, 2 to 3 lines long, with a coloured tubercle on the midrib.

N. S. Wales. Hunter's river, *Oldfield.*
Victoria. On roadsides about Melbourne, *Adamson, F. Mueller.*
S. Australia. Barker town, *F. Mueller.*

Common in Europe and temperate Asia, and now naturalized in many other parts of the globe. The Australian specimens, like others grown in warm and dry climates, have tubercles on all three inner perianth-segments. More northern specimens have them frequently only on one segment of each perianth.

2. **R. conglomeratus,** *Murr.; Meissn. in DC. Prod.* xiv. 49. An erect perennial of 2 or 3 ft. more branched than *R. crispus*. Radical leaves on long petioles, mostly acute, rounded or even cordate at the base, sometimes 8 to 10 in. long, the upper ones smaller. Panicle with long rather spreading branches, the clusters of flowers distinct or distant even when in fruit. Fruiting perianth smaller than in *R. crispus*, the inner segments narrow-ovate, entire, with an oblong tubercle on the midrib of each.—*R. acutus,* Sm. and some others.

Queensland. About Brisbane, *C. Stuart.*
N. S. Wales. Port Jackson, *Woolls.*
Victoria. About Melbourne, *F. Mueller.*

Like *R. crispus*, this species is indigenous in Europe and temperate Asia, and is now become naturalized in many other parts of the globe.

3. **R. Brownii,** *Campd. Monogr. Rum.* 81. A perennial with a thick rhizome and erect simple or slightly branched stems of 1 to 2 ft. Radical and lower leaves on long petioles, often cordate or hastate, oblong and obtuse, the stem-leaves mostly lanceolate and acute, the floral ones reduced to small bracts or quite deficient. Clusters remote, many-flowered, forming long simple or slightly-branched racemes, the fruiting pedicels slender or thick, 1 to 3 lines long. Inner segments of the fruiting perianth broadly triangular, 1½ to 2 lines long, bordered on each side by 4 to 6 bristles, much hooked or almost involute at the end,

the midrib prominent but without any distinct tubercle.—Meissn. in DC. Prod. xiv. 61; Hook. f. Fl. Tasm. i. 305; *R. fimbriatus*, R. Br. Prod. 421 not of Poir.

Queensland. Rockhampton, *O'Shanesy.*

N. S. Wales. Port Jackson, *R. Brown, Woolls;* Newcastle everywhere where sheep have been, *Leichhardt:* Macleay river, *Beckler.*

Victoria. Plenty river, *F. Mueller;* Wendu Vale, *Robertson.*

Tasmania. Abundant in marshy places, Circular Head, &c., *J. D. Hooker.*

S. Australia. Adelaide and Torrens river, *F. Mueller;* Kangaroo island, *Hinzenrode.*

4. **R. pulcher,** *Linn.; Meissn. in DC. Prod.* xiv. 58. Stems erect, short below the inflorescence, the flowering branches very spreading, forming a broad panicle of above 1 ft. Radical and lower leaves on long petioles, oblong-lanceolate or almost linear, 2 to above 6 in. long, slightly crisped on the margins, often contracted in the middle and obtuse or cordate at the base, the lower floral leaves linear and sometimes above 1 in. long, all the others reduced to small bracts or obsolete. Clusters distant, the flowers more numerous than in *R. dumosus*, less so than in *R. Brownii*. Pedicels shorter or longer than the perianth. Inner segments of the fruiting perianth lanceolate or triangular, 2 to 3 lines long, with a rigid point and 2 or 3 rigid subulate teeth on each side, straight or rarely slightly hooked at the extremity, the midrib bearing a prominent callous tubercle.—*R. oxysepalus*, Meissn. in Pl. Preiss. i. 625; *R. Drummondii*, Meissn. in Pl. Preiss. ii. 272 and in DC. Prod. xiv. 61.

Victoria? Near Melbourne, *Adamson, Robertson* (specimens in flower only).

W. Australia, *Drummond, n.* 27, 108, 207, 703; *Preiss, n.* 1357; Kalgan river, *Oldfield;* N. of Stirling range, *F. Mueller.*

The species is common in a great part of Europe, Western Asia, and Northern Africa, extending to South Africa, and possibly introduced from thence into West Australia. The Melbourne specimens, as well those above quoted as those of F. Mueller, corresponding to others previously sent to London and described by Meissner as *R. Muelleri* (in DC. Prod. xiv. 61), are not far enough advanced to determine accurately, and may belong to a luxuriant form either of *R. pulcher* or of *R. dumosus.* The lower leaves are sometimes 10 in. long.

5. **R. dumosus,** *A. Cunn.; Meissn. in DC. Prod.* xiv. 62. "A divaricate bushy plant" spreading to 2 or 3 ft., the flowering branches when in an advanced state numerous intricate flexuose and dichotomous. Lower leaves long, but not seen perfect, the upper ones small, lanceolate, acuminate, but all even the uppermost floral ones longer than the flowers. Clusters distant, composed of very few, often only 2 or 3 flowers, the pedicels 1 to 2 lines long, sometimes hardened after the fall of the fruit. Inner segments of the fruiting perianth about 2 lines long, rigid acute and prominently reticulate, without tubercles, bordered by rigid subulate almost spinescent teeth not hooked, the small outer segments sometimes muricate on the keel.—*R. Brownii*, Schlecht. in Linnæa. xx. 576 (from the descr.), not of Campd.

N. S. Wales. Liverpool plains, and plains subject to inundation on the Cujeegong and Goulburn rivers, *A. Cunningham.*

S. Australia. Torrens river, *F. Mueller.*

6. **R. halophilus,** *F. Muell. Fragm.* iv. 48. An erect branching herb of about 1 ft., some specimens appearing annual. Leaves linear or lanceolate, acute or obtuse, the lower ones on long petioles sometimes cordate at the base and 2 to 3 or even 4 in. long, the upper ones small, but all or nearly all longer than the flowers. Flowers very small and very numerous, in dense axillary clusters crowded on the greater part of the plant. Inner segments of the fruiting perianth sometimes under 1 line long, with long fine points and marginal teeth, sometimes rather longer and broader with shorter and more rigid points and teeth, always with a very prominent ovoid tubercle on the midrib.

N. Australia. Gulf of Carpentaria, *F. Mueller.*

Queensland. Flinders and Burnett rivers, *F. Mueller;* Darling Downs, *Lau.*

N. S. Wales. Darling river, *Goodwin and Dallachy*, *Mrs. Ford;* Murray river, *F. Mueller.*

This plant has entirely the aspect of the European *R. maritimus*, Linn., and may be a variety only. The teeth of the fruiting perianth segments although fine and long are however always much less so than in the northern plant.

7. **R. bidens,** *R. Br. Prod.* 421. A perennial with a thick stem, rooting at the joints and creeping in the mud, throwing up numerous erect thick flowering branches of 1 to 2 ft. Leaves lanceolate, the lower ones often 8 to 10 in. long, rather broad and obtuse, the upper ones narrower and more acute, passing into the small almost linear floral leaves. Flowers densely clustered, unisexual, but the two sexes mixed in the same clusters, the lower ones chiefly females the upper ones chiefly or entirely males. Perianth-segments at the time of flowering almost petaloid and not very unequal. Inner segments of the fruiting perianth variable in size, usually 2 to 3 lines long, very broad, with 1 or 2 rigid teeth on each side near the base, the midrib more or less thickened into a tubercle.—Meissn. in DC. Prod. xiv. 73; Hook. f. Fl. Tasm. i. 305.

Victoria. On the Yarra about Melbourne, *Harvey*, *F. Mueller.*

Tasmania. Port Dalrymple and Lagoon Beach, *R. Brown;* common in marshes in the northern part of the island, *J. D. Hooker.*

S. Australia. Murray river, *Behr.;* near Morunda, *F. Mueller;* with a small starved, small-flowered variety.

*8. **R. acetosella,** *Linn.; Meissn. in DC. Prod.* xiv. 63. A slender plant with a creeping rhizome and erect stems from a few in. to nearly 1 ft. high, often turning red. Leaves narrow-lanceolate or linear, some or all hastate or sagittate at the base; stipules usually silvery and very thin. Flowers small, diœcious, in slender terminal panicles, the clusters numerous, few-flowered, without floral leaves. Perianth-segments broad, entire, not very unequal, the inner ones in the fruiting perianth closed over the seed but scarcely enlarged.

A plant probably of European and Asiatic origin, now common in most temperate and subtropical regions of the globe, and evidently introduced only into Australia, where it has appeared in **N. S. Wales, Victoria, S. Australia,** and **W. Australia.** It is in R. Brown's collection from the neighbourhood of Port Jackson, but omitted from the Prodromus as an introduced plant.

3. POLYGONUM, Linn.

Flowers usually hermaphrodite. Perianth of 5, rarely fewer, segments, all equal or the 2 or 3 outer ones enlarged. Stamens 5 to 8, varying often in the same species. Styles or style-branches 2 or 3, with entire terminal stigmas. Nut flattened or triangular, enclosed in or surrounded by the persistent perianth. Embryo lateral, more or less curved, the radicle superior.—Herbs varying much in habit. Stipules in the majority of species thinly scarious, closely sheathing, the lower portion adnate to the petiole, the greater part connate within it; in the section *Avicularia* looser jagged and silvery. Flowers small, pale green or red with white edges, either clustered or rarely solitary in the axils, or in little clusters within a sheathing bract arranged in simple or paniculate spikes.

A large genus, with almost the cosmopolitan range of the Order. Of the thirteen Australian species, four are common European species extending more or less generally over the temperate and subtropical regions of the globe, five are distributed over the warmer portions of Asia, one or two of them being also found in South America, another appears to be also S. American although not yet identified with any Asiatic species; one more extends at least to New Caledonia, and one to New Zealand; the only remaining one may be endemic, although not yet perhaps sufficiently known.

SECT. 1. **Avicularia.**—*Flowers in axillary clusters. Stems prostrate.*

Stems elongated and wiry. Perianth about 1½ lines long. Nut minutely granular-striate . . . . 1. *P. aviculare.*
Stems short and compact. Perianth under 1 line long. Nut smooth and shining . . . . 2. *P. plebeium.*

SECT. 2. **Echinocaulon.**—*Flowers in very short spikes on axillary dichotomous peduncles. Stems usually scrambling, with short reversed bristles on the angles.*

Single Australian species . . . . 3. *P. strigosum.*

SECT. 3. **Persicaria.**—*Flowers spicate, the spikes in terminal panicles, or rarely solitary and terminal or axillary. Embryo curved towards the edge of the cotyledons. Nut flat or convex on both sides or triquetrous.*

Spikes solitary, mostly axillary. Stem prostrate . . . . . 4. *P. prostratum.*
Spikes terminal, long, slender and interrupted, usually single. Stem slender, erect. Perianth densely glandular-dotted . . 5. *P. hydropiper.*
Spikes usually continuous and 2 or more in a terminal panicle. Perianth without any or with few glandular dots. Stem erect or ascending.
  Stipules bordered by bristles usually long, at least the upper ones.
    Glabrous. Spikes few and slender . . . . 6. *P. minus.*
    Strigose-hirsute. Spikes slender, pedunculate. Leaves nearly sessile . . . . 7. *P. subsessile.*
    Strigose-hirsute. Spikes compact, on short peduncles. Bristles of the stipules very long . . . . 8. *P. barbatum.*
  Stipules truncate, without any or with a few fine short cilia.
    Strigose-hirsute. Spikes compact . . . . 9. *P. articulatum.*
    Glabrous or nearly so . . . . 10. *P. lapathifolium.*
    Cottony-white . . . . 11. *P. lanigerum.*

Sect. 4. **Amblygonon.** *Flowers spicate, the spikes in terminal panicles. Embryo curved towards the back of the cotyledons. Nut usually flat on both sides, with obtuse margins. Stems tall and erect.*

Stipules, at least the lower ones, dilated and green at the top . 12. *P. orientale.*
Stipules all closely sheathing and scarious to the top . . . . . 13. *P. attenuatum.*

Muhlenbeckia Cunninghamii has almost the styles and stigmas of *Polygonum*, but the flowers are diœcious.

Sect. 1. Avicularia, Meissn.—Flowers in axillary clusters. Stems (in the Australian species) prostrate.

1. **P. aviculare,** *Linn. Meissn. in DC. Prod.* xiv. 97. A glabrous annual, much branched at the base, sometimes erect or ascending when young, but the stems soon prostrate, wiry, extending to 1 or 2 ft. or even more. Leaves shortly petiolate, elliptical oblong lanceolate or rarely linear, the larger ones above 1 in. long but mostly smaller. Stipules broad, more or less brown at the base, the remainder silvery and split into finely pointed lobes. Flowers axillary, solitary or in clusters of 2 to 5, very shortly pedicellate. Fruiting perianth above 1 line long, the segments green in the centre, white on the margins. Styles 3. Nut triangular, black but opaque (not shining) owing to a minute granulation visible under a strong lens.

Victoria. Near Melbourne, *Adamson, Hildebrand;* Skipton, *Whan.*
S. Australia. Near Adelaide, *F. Mueller.*
W. Australia, *Drummond, n.* 231.

A common weed, apparently of European or Asiatic origin, but now found over a great part of the globe, especially in temperate regions, and probably introduced only in Australia.

2. **P. plebeium,** *R. Br. Prod.* 420. A much branched prostrate annual, much more compact than *P. aviculare*, and rarely above 1 ft. long, glabrous or the branches slightly hoary. Leaves linear, narrow-oblong or slightly spathulate, rarely above $\frac{1}{2}$ in. long. Stipules as in *P. aviculare* short silvery and ragged at the edges. Flowers very small, in clusters of 2 to 5 in the axils of most of the leaves. Fruiting perianth under 1 line long, the segments green, with a narrow white edge. Nuts triangular, very smooth and shining.—Meissn. in DC. Prod. xiv. 94; Benth. Fl. Hongk. 287, with the synonyms there adduced.

Queensland. Broad Sound, *R. Brown;* Brisbane river, Moreton Bay, *A. Cunningham, F. Mueller* and others; Gilbert river, *F. Mueller;* Rockhampton, *O'Shanesy;* Wide Bay, *Bidwill;* Kennedy district, *Daintree.*
N. S. Wales. Glendon, *Leichhardt;* Murray and Darling rivers, *Dallachy, Mrs. Ford* and others; Stokes Range to Cooper's Creek, *Wheeler.*
Victoria. Murray river, *F. Mueller;* Wimmera, *Dallachy.*
S. Australia. Bugle Range, *F. Mueller;* Cooper's Creek, *Howitt's Expedition.*

Exceedingly common all over tropical Asia, extending into Africa. Very near *P. aviculare*, but amidst all its variations it seems to me constantly to differ from that species in its compact habit and small flowers, and in the nuts always smooth and shining.

Sect. 2. Echinocaulon, Meissn.—Flowers in very short spikes on axillary dichotomous peduncles. Stems usually scrambling, with short reversed bristles on the angles.

3. **P. strigosum,** *R. Br. Prod.* 420. Stems weak, erect or straggling, 2 to 3 ft. long, with reflexed bristles on the angles of the branches and on the petioles and midribs of the leaves, and a short glandular pubescence on the peduncles, otherwise the whole plant glabrous. Leaves petiolate, lanceolate, acuminate, hastate or broadly sagittate at the base, the larger ones 2 to 4 in. long. Stipules sheathing, shortly ciliate-toothed or entire. Peduncles axillary, loosely dichotomous, usually longer than the leaves, the branches terminating in short rather dense but few-flowered spikes. Bracts denticulate and ciliate, nearly 2 lines long. Perianth-segments about 1½ lines long, slightly enlarged when in fruit, completely enclosing the smooth nut. Style-branches and angles of the nut more frequently 3 than 2.—Meissn. in DC. Prod. xiv. 134; Hook. f. Fl. Tasm. i. 307; *P. pedunculare,* Wall.; Meissn. l.c. 133; *P. muricatum,* Meissn. l.c.

Queensland. Brisbane river, Moreton Bay, *A. Cunningham, F. Mueller;* Rockingham Bay, *Dallachy.*

N. S. Wales. Port Jackson, *R. Brown, Woolls;* Newcastle, *Leichhardt;* New England, *C. Stuart;* Hastings and Clarence rivers, *Beckler* and others.

Victoria. Ovens and Plenty rivers, *F. Mueller.*

Tasmania. Port Dalrymple, *R. Brown;* northern parts of the island, *J. D. Hooker;* Launceston, *Gunn;* South Esk river, *C. Stuart.*

The species extends over the Archipelago and Eastern India to S. China, varying with the spikes dense or slender and interrupted, and with the pistils 2-merous or 3-merous on the same plant.

SECT. 3. PERSICARIA.—Flowers spicate, the spikes in terminal panicles, or rarely solitary and terminal or axillary. Embryo curved towards the edge of the cotyledons (accumbent) or sometimes oblique. Nut flat or convex on both sides or triquetrous.

4. **P. prostratum,** *R. Br. Prod.* 419. A prostrate branching perennial, often woody at the base and rooting at the lower nodes, extending to 1 or 2 ft., sprinkled with slender appressed hairs or nearly glabrous. Leaves lanceolate, contracted into a short petiole 1 to 1½ or rarely 2 in. long. Stipules sheathing, ciliate with a few long hairs on the back and margins. Spikes shortly pedunculate, axillary or rarely terminal, about ½ in. or rarely ¾ in. long, rather dense. Perianth scarcely 1 line long when in flower, slightly enlarged afterwards. Stamens 5 or 6. Style-branches 2, not enclosed in the perianth, lenticular, both sides very convex.—Meissn. in DC. Prod. xiv. 116; Hook. f. Fl. Tasm. i. 307.

Queensland. Rockhampton, *O'Shanesy.*

N. S. Wales. Nepean river, *R. Brown, Woolls;* New England, *C. Stuart;* Argyle county, *A. Cunningham.*

Victoria. Glenelg river, *Robertson;* Yarra, Sandy Creek, Ballarat, *F. Mueller;* Murray river, *Herrgott;* Emu Creek, *Whan.*

Tasmania. Port Dalrymple and Derwent river, *R. Brown;* not uncommon in various parts of the island, *J. D. Hooker.*

S. Australia. Near Morunda, *F. Mueller.*

W. Australia, *Drummond, 5th coll. n.* 230.

The species is also in New Zealand.

5. **P. hydropiper,** *Linn.; Meissn. in DC. Prod.* xiv. 109. A slender erect or decumbent glabrous annual, 1 to 2 ft. high. Leaves lanceolate, acuminate. Stipules sheathing, rather short, ciliate at the top. Spikes slender and interrupted, often several in. long, solitary or nearly so at the ends of the stem or branches and often nodding. Perianth and often the bracts also dotted with prominent glands. Style-branches usually 2. Nuts flat.—*P. gracile*, R. Br. Prod. 419; Meissn. in DC. Prod. xiv. 109.

N. S. Wales. Port Jackson, *R. Brown*, *Woolls*; Hunter's river, *Leichhardt*; Clarence river, *Beckler*.

Victoria. Yarra-Yarra, *Robertson*, *F. Mueller*; Goulburn river, *F. Mueller*.

The species is widely diffused over Europe, temperate and subtropical Asia and North America I can perceive no difference between the Australian and many of the northern specimens.

6. **P. minus,** *Huds.; Meissn. in DC. Prod.* xiv. 111. Rather slender, erect or decumbent, smaller and less branched than *P. lapathifolium*, rarely exceeding 2 ft., quite glabrous in the typical form. Leaves shortly petiolate, lanceolate, acuminate. Stipules closely sheathing, the margins ciliate. Spikes 1 to 1½ in. long, few in a terminal panicle, more slender than in *P. lapathifolium*, much less so than in *P. hydropiper*. Bracts small, naked or shortly ciliate. Perianth small, not glandular. Stamens 5 or 6. Style-branches 2 or 3, varying often in the same spike, more frequently 3 than 2 in the Australian specimens.—Hook. f. Fl. Tasm. i. 306; *P. decipiens*, R. Br. Prod. 420; Meissn. in DC. Prod. xiv. 104.

Queensland. Brisbane, Burnett, and Burdekin rivers, *F. Mueller*; Moreton island, *M'Gillivray*; Rockhampton, *O'Shanesy*; Rockingham Bay, *Dallachy*; in the interior, *Mitchell*.

N. S. Wales. Port Jackson, *R. Brown*, *Woolls*; Argyle county, *Backhouse*; New England, *C. Stuart*.

Victoria. Murray and Yarra rivers, *F. Mueller*, *Robertson*; Portland, *Allitt*; Emu Creek, *Whan*.

Tasmania. Common in the northern parts of the island, *J. D. Hooker*.

S. Australia. Murray and Torrens rivers and Holdfast Bay, *F. Mueller*.

W. Australia, *Drummond*, n. 20; Moore river, *Oldfield*.

The species is very common in the temperate, subtropical, and even tropical regions of the Old World, and varies much. In Australia some specimens agree with the commonest European forms, in others, chiefly from Queensland, the cilia of the stipules are longer, there are a few small strigose hairs on the under side of the leaves, and the pistil is almost always 3-merous. These constitute probably (with corresponding European forms) the *P. serrulatum*, Lag. cited from Australia and New Zealand by Meissn. in D.C. Prod. xiv. 110.

7. **P. subsessile,** *R. Br. Prod.* 419. A perennial with an almost woody rhizome and erect loosely branched stems attaining 2 or 3 ft., the whole plant more or less strigose with appressed hairs, short on the upper side of the leaves, longer underneath. Leaves lanceolate, acuminate, mostly 3 or 4 in. long, contracted into a very short petiole. Stipules sheathing, much longer than the petiole, bordered by long cilia. Spikes rather slender, 1 to 2 in. long, usually 2 to 4 on long peduncles in a loose terminal panicle. Perianth-segments petal-like,

not glandular. Stamens 5. Style-branches 2, rather long. Nut lenticular, the sides very convex.—Meissn. in DC. Prod. xiv. 113; Hook. f. Fl. Tasm. i. 306.

Queensland. Brisbane river, Moreton Bay, *F. Mueller, C. Stuart;* Rockhampton, *O'Shanesy;* Rockingham Bay, *Dallachy.*

N. S. Wales. Port Jackson, *R. Brown, Woolls;* New England, *C. Stuart.*

Victoria. Goulburn, Yarra-Yarra, and Tara rivers, *F. Mueller.*

Tasmania. Port Dalrymple, *R. Brown;* northern parts of the island, *J. D. Hooker.*

The species appears to be also in New Caledonia, if I am right in identifying with it Viellard's n. 1075.

8. **P. barbatum,** *Linn.; Meissn. in DC. Prod.* xiv. 104. Stems ascending or erect, glabrous or nearly so, 2 to 3 ft. high. Leaves lanceolate, contracted into a short petiole although not so short as in *P. subsessile,* 3 to 6 in. long, sprinkled with appressed hairs never wanting on the midrib underneath. Stipules sheathing hairy, outside, bordered by very long cilia. Spikes in the common form compact, 1 to 1½ in. long, on short peduncles in a narrow terminal panicle, in some Asiatic varieties drawn out and slender. Bracts always ciliate on the margin. Stamens 5 or 6. Style-branches (always?) 3. Nut triangular.

Queensland. Roper and Burnett rivers, *F. Mueller;* Port Curtis, *M'Gillivray.*

The species is common in tropical Asia and Africa.

9. **P. articulatum,** *R. Br. Prod.* 420. Erect and rather stout, the stems glabrous below, hirsute in the upper part with appressed hairs. Leaves lanceolate, tapering into long points and contracted into rather long petioles, 3 to 6 in. long, hirsute on both sides with appressed hairs short and strigose on the upper surface, longer and more silky underneath, rigid on the margins. Stipules sheathing, long and truncate, without any or only with few very short marginal cilia. Spikes few, rather dense, 1 to 2 in. long. Bracts shortly ciliate. Styles 2. Nut compressed, the sides rather convex. Curvature of the embryo in the two seeds examined rather oblique with relation to the cotyledons, but more accumbent than incumbent.—Meissn. in DC. Prod. xiv. 117; *P. australe,* Spreng. Syst. ii. 258.

Queensland. Broad Sound and Shoalwater Bay, *R. Brown.*

I have not seen this in any other collection, and have not been able to match it with any Asiatic species. The habit is that of *P. barbatum* and *P. glabrum,* differing from the former in the want of the long cilia or bristles to the stipules, from the latter in the indumentum, which is that of *P. subsessile,* from which it is removed by the long petioles and the want of cilia to the stipules.

10. **P. lapathifolium,** *Linn.; Meissn. in DC. Prod.* xiv. 119. Tall erect and glabrous, except sometimes very short strigose hairs on the margins and midrib of the leaves, and in some varieties a very slight hoariness on their under surface. Leaves lanceolate or ovate-lanceolate, acuminate, 3 to 6 in. long or even larger, contracted into a petiole usually exceeding the stipules, the glandular dots of the under surface more conspicuous than in many species. Stipules sheathing, without marginal bristles or rarely with a few very small cilia. Spikes rather

slender, from under 1 to above 2 in. long, in a terminal branching more or less leafy panicle. Bracts small, truncate or shortly acuminate. Perianth, at least the outer segments, more or less glandular and the prominent glands extending sometimes to the bracts and peduncles. Stamens 5 or 6. Style short with 2 long branches. Nut very flat, the sides concave or rarely slightly convex. Radicle curved towards the edge of the cotyledons (accumbent).—*P. nodosum*, Pers.; Meissn. in DC. Prod. xiv. 118; *P. glandulosum*, R. Br. Prod. 419; Meissn. l.c. 116; *P. adenophorum*, Spreng. Syst. ii. 258; *P. elatius*, R. Br. l.c. 419; Meissn. l.c. 121.

Queensland. Brisbane river, *C. Stuart;* Neikool Creek, *Bowman;* Armadilla, *Barton.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and others; New England, *C. Stuart;* Argyle County, *A. Cunningham;* Darling river, *Mrs. Ford.*

Victoria. From the Glenelg to Gipps' Land, *Robertson, F. Mueller,* and others.

Tasmania. Port Dalrymple, *R. Brown.*

Common in the temperate and subtropical regions of the New and the Old World, especially in the northern hemisphere. The *P. nodosum*, to which Meissner refers the Australian specimens, is distinguished by him from the typical *P. lapathifolium* chiefly by the comparative absence of glands or glandular pubescence on the peduncles; but in this respect the Australian specimens vary as much as the European ones. Brown's *P. elatius* included the broad-leaved, *P. glandulosum* the narrow-leaved specimens.

11. **P. lanigerum,** *R. Br. Prod.* 419. Stems erect, slightly branched, attaining 2 or 3 ft., the whole plant white with a close woolly or arachnoid tomentum, or the upper surface of the leaves and the lower part of the stem at length glabrous. Leaves shortly petiolate, lanceolate, acuminate, 3 to 4 in. long or even larger. Stipules sheathing, usually long, bordered by few fine cilia. Spikes narrow but rather dense, 1 to 1½ in. long, several in a terminal panicle. Bracts short, denticulate-ciliate. Perianth often glandular. Style short, with 2 long branches. Nut flat.—Meissn. in DC. Prod. xiv. 117.

Queensland. Burdekin river, *F. Mueller.*

N. S. Wales. Hawkesbury, *R. Brown;* also in *Leichhardt's* collection.

Victoria. Wheat fields, Snowy river, *F. Mueller.*

The species is common in E. India, and extends to S. Africa. Although nearly allied to *P. lapathifolium*, of which F. Mueller considers it as a variety, it appears constantly to differ from the var. *incanum* of that species, in the abundance of the white indumentum, and is said to be perennial not annual.

SECT. 4. AMBLYGONON, Meissn.—Flowers spicate, the spikes in terminal panicles. Embryo curved towards the back of the cotyledons (incumbent). Stems tall and erect. Nuts usually flat on both sides with obtuse margins.

12. **P. orientale,** *Linn.; Meissn. in DC. Prod.* xiv. 123. An erect softly pubescent or hirsute annual of 2 to 5 ft. Leaves on rather long petioles, ovate or the upper ones lanceolate, acute or acuminate, 3 to 6 in. long. Stipules very hairy, closely sheathing and scarious at the base, but all except the uppermost expanded at the top into a green spreading limb. Spikes (especially in the hirsute form) rather slender,

continuous or slightly interrupted, several in a loose terminal panicle. Bracts hairy and ciliate. Flowers rather large. Stamens usually 7. Style with 2 slender branches. Nut flat or the sides convex, the margin obtuse. Radicle curved towards the back of the cotyledons.—R. Br. Prod. 420.

Queensland. Rockingham Bay, *Dallachy;* Rockhampton, common on the edges of lagoons, &c., *Dallachy, O'Shanesy, Bowman;* Archer's station, *Leichhardt;* Moreton Bay, *C. Stuart.*

N. S. Wales. Port Jackson, *R. Brown;* Blue Mountains, *Woolls.*

Most of the Australian specimens belong to the var. *pilosum*, Meissn. (*P. pilosum*, Roxb.), which extends over E. India to S. China and which I am also unable to distinguish from the S. American *P. hispidum.* H. B. K., or at least from the Brasilian specimens quoted and figured by Meissner in Mart. Fl. Bras. Polyg. 13. t. 2, in which I find the embryo of *Amblygonon* and not of *Persicaria.* Of the more glabrous broad-leaved variety, with shorter, more nodding spikes, considered as the typical Asiatic plant, I have seen no Australian specimens except Woolls's, which may possibly have been introduced.

13. **P. attenuatum,** *R. Br. Prod.* 420. A tall species, very nearly allied to *P. orientale*, the stems and foliage more or less sprinkled with rather fine appressed hairs, hoary when young, or sometimes nearly glabrous. Leaves lanceolate, tapering into a very long point and contracted into a rather long petiole, mostly above 6 in. long. Stipules entirely sheathing, truncate and shortly ciliate, without the green limb of *P. orientale.* Spikes continuous, 1½ to 3 in. long, few on rather long peduncles in a terminal panicle. Bracts rather thick, truncate, shortly ciliate or entire. Perianth, stamens, style, nut and embryo entirely of *P. orientale.*—Meissn. in DC. Prod. xiv. 117.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* Upper Victoria river, Sturt's Creek, Wentworth, Flinders and Macarthur rivers, *F. Mueller.*

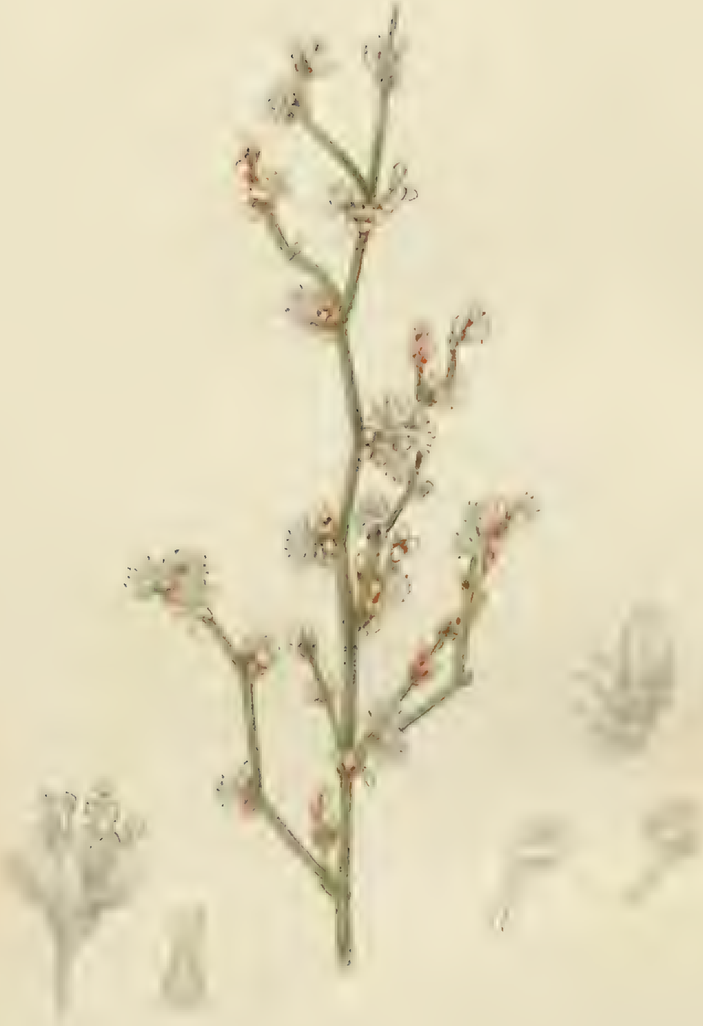
N. S. Wales? Near the Darling river, *Victorian Expedition* (a very imperfect specimen).

S. Australia. Cooper's Creek, *Howitt's Expedition;* Cooper's and Thomson's rivers, *A. C. Gregory.*

I have not identified this with any Asiatic species, but I am unable to distinguish it from the Brasilian *P. spectabile*, Mart.; Meissn. in DC. Prod. xiv. 119, and in Mart. Fl. Bras. Polygon. 13. t. 3, in the seeds of which I find the radicle incumbent as in *Amblygonum.* Meissner has not figured the embryo either in this or in *P. hispidum.*

4. MUHLENBECKIA, Meissn.

Flowers mostly diœcious. Perianth of 5 segments, all equal or the outer ones slightly enlarged. Stamens 8 or rarely fewer, filaments short, the anthers oblong in the males, small and imperfect or abortive in the females. Ovary in the females 3-angled, with a very short trifid style and 3 more or less fringed stigmas, small and rudimentary in the males. Nut triangular or nearly globular, enclosed in the persistent membranous or succulent perianth.—Undershrubs shrubs or woody twiners, rarely herbaceous from the base; all at least of the Australian species glabrous. Stipules brown and scarious, loosely sheathing, very soon torn or ragged. Flowers small, green or whitish, in whorl-like clusters, axillary or within small sheathing bracts, in



axillary or terminal simple or paniculate interrupted spikes. Radicle usually curved towards the back of the cotyledons (incumbent), rarely here and there towards their edge (accumbent).

The genus extends to New Zealand, extratropical S. America, and along the Andes to Mexico. Of the seven Australian species, one is identical with a New Zealand one, another is closely allied as well to a New Zealand as to a S. American species, the others appear to be endemic.

Leaves more or less cordate hastate or sagittate, usually broad and above 1 in. long. Stem prostrate or climbing.
Fruit globular, obscurely angled, not rugose, with the perianth succulent. Spikes mostly axillary.
Leaves rather thick, obtuse or shortly acuminate . . . . 1. *M. adpressa.*
Leaves thin, with a long point. Spikes very slender. Flowers small . . . . 2. *M. gracillima.*
Fruit ovoid, more or less 3-angled, very rugose. Leaves rather thick. Spikes mostly in a large terminal panicle . 3. *M. rhyticarya.*
Leaves ovate or rounded, under ½ in. long. Stems short, prostrate, and densely matted. Fruit prominently 3-angled . . 4. *M. axillaris.*
Leaves narrow, tapering at the base. Erect or diffuse undershrubs or shrubs.
Stems stout, decumbent, not much branched. Leaves broadly lanceolate. Spikes axillary. Fruit globular . . . . . 5. *M. polybotrya.*
Shrub. Leaves on luxuriant branches lanceolate or rarely hastate, on the others small and linear. Clusters axillary, with few small flowers. Fruit globular, 3-angled . . . . 6. *M. polygonoides.*
Shrub. Leaves on luxuriant branches linear, on the others very small or none. Clusters mostly in terminal spikes. Fruit prominently 3-angled . . . . 7. *M. Cunninghamii.*

1. **M. adpressa,** *Meissn. Gen. Pl. Comm.* 227, *in Pl. Preiss.* ii. 272, *and in DC. Prod.* xiv. 145. Stems woody at the base, prostrate and spreading or climbing. Leaves petiolate, from orbicular-cordate to broadly lanceolate, hastate, obtuse or scarcely acuminate, rarely under 1 in. long except on the smaller branchlets, and in luxuriant specimens 3 in. or more, the margins often undulate-crisped. Spikes interrupted, 1 to 2 or even 3 in. long, solitary or clustered in the axils, scarcely paniculate at the end of the branches, the flower-clusters distant, the lowest usually at the base of the rhachis and sometimes the whole spike reduced to a sessile cluster. Bracts 1 to 2 lines long. Flowers few in each cluster, the males more numerous than the females. Fruiting perianth globular, more or less succulent. Nut completely enclosed in the perianth, nearly globular, the three angles very obtuse or obscure, not rugose. Seed with 3 longitudinal furrows.—Hook f. Fl. Tasm. i. 308; *Polygonum adpressum*, Labill. Pl. Nov. Holl. i. 99, t. 127; R. Br. Prod. 420 (partly); *Sarcogonum adpressum*, Don. in Sweet Hort. Brit. ed. 3, 577 (*Meissner*).

The three following forms of this plant appear to be nearly constant enough to be reckoned as distinct species.

a. rotundifolia. Stems trailing on the ground or climbing on bushes, rarely above 6 ft. high. Leaves broad and short. Perianth not very succulent.

N. S. Wales? Medway river near Berrima, *Miss Atkinson.* (Uncertain, the specimens in leaf only).

Victoria. Wendu vale, *Robertson;* mouth of the Glenelg, *Allitt;* Wimmera, *Dallachy;* Yowaka river, *F. Mueller.*

Tasmania. Port Dalrymple, *R. Brown;* common along the seacoast, *J. D. Hooker.*

S. Australia. Seacoast, Spencer's and St. Vincent's gulfs, *F. Mueller* and others; Kangaroo islands, *Waterhouse;* Gawler ranges, *Sullivan.*

W. Australia. *Labillardiere;* Swan river, *Drummond, n.* 204, *Preiss, n.* 1205, *Oldfield;* Kalgan and Gordon rivers, *Oldfield;* Stirling and Plantagenet ranges to Cape Arid, *Maxwell.*

b. hastifolia, Meissn. Leaves broadly lanceolate-hastate, twice or three times as long as broad, mostly acuminate. Stems climbing over the tops of tall trees. Flowers and fruiting perianths large, the latter very succulent.—*M. Gunnii,* Hook. f. in Hook. Lond. Journ. vi. 278; *Polygonum adpressum,* Hook. Bot. Mag. t. 3145.

Tasmania. In humid forests on rich soils, *Gunn.*

S. Australia. Near Port Adelaide, *F. Mueller.*

c. flexuosa. Leaves scarcely 1 in. long, broad, obtuse or shortly acuminate. Flowers smaller than in the type and chiefly in axillary clusters. Fruit not seen.—*M. flexuosa,* Meissn. in Pl. Preiss. i. 624, and in DC. Prod. xiv. 148.

W. Australia. Middle island, *A. Cunningham;* Goderich district, *Preiss, n.* 1355; Gordon and Kalgan rivers, *Oldfield;* Albany, *F. Mueller.*

Hooker (Handb. Fl. N. Zeal. 236) and some others have considered this and the *M. australis,* Forst., a native of New Zealand and Norfolk Island, as one species. In the latter, however, the inflorescence is more branched, the nut more shining, very prominently 3-angled, and usually exceeding the scarcely succulent perianth, and it seems to me to be at least as distinct as the *M. gracillima.*

2. **M. gracillima,** *Meissn. in DC. Prod.* xiv. 145. A tall herbaceous twiner, much more slender than *M. adpressa* and *M. rhyticarya.* Leaves on long petioles, ovate-cordate or broadly sagittate, acuminate, membranous, the margins usually crisped, 1 to 2 or rarely 3 in. long. Spikes very slender, almost filiform, simple or paniculately branched, the males much longer and more branched than the females, the flower-clusters small and distant. Perianth not above 1 line diameter when fully spread. Stigmas large and copiously fringed. Fruiting perianth globular and succulent, enclosing an opaque obscurely 3-angled nut as in *M. adpressa,* but considerably smaller.—*Polygonum adpressum,* R. Br. Prod. 420 (partly).

Queensland. Moreton Bay, *Leichhardt;* Rockhampton, *O'Shanesy;* Dawson and Burnett rivers, *F. Mueller.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and others; New England, *C. Stuart;* Glendon, *Leichhardt;* Macleay, Clarence and Hastings rivers, *Beckler;* southward to Illawarra, *Herb. Hooker and F. Mueller.*

3. **M. rhyticarya,** *F. Muell. Fragm.* v. 92. Stems climbing, woody at the base. Leaves mostly broadly ovate-cordate, obtuse or shortly acuminate, 1 to 2 in. long, often rather thick and glaucous, resembling those of the broad-leaved form of *M. adpressa.* Spikes long and interrupted in the upper axils, and forming a large loose terminal panicle. Flowers rather larger than in *M. adpressa.* Fruiting perianth almost membranous, enclosing an ovoid-triquetrous nut often 2 lines long and deeply rugose. Seed scarcely furrowed.

Queensland. Cape York, *Daemel;* Port Denison, *Fitzalan;* Edgecombe and Rockingham Bays, *Dallachy.*

N. S. Wales. New England, *C. Stuart;* Shoalhaven Gullies, *C. Moore.*

R. Brown's specimens of *Polygonum adpressum,* from Keppel and Shoalwater Bays, appear to belong to *M. rhyticarya,* but they are not in fruit.

4. **M. axillaris,** *Hook. f. in Hook. Lond. Journ.* vi. 278; *Fl. Tasm.* i. 308. A small diffuse or prostrate shrub, forming matted patches of a few in. diameter, or sending out weak flexuose stems of 6 in. to nearly 1 ft. Leaves on slender petioles, ovate oblong or almost orbicular, under ½ in. long. Flowers small, solitary or 2 or 3 together in the upper axils or at the ends of the branches, on very short pedicels. Stigmas at length denticulate but without the long fringes of most species. Nuts as long as the scarcely succulent fruiting perianth, smooth and prominently 3-angled. Seed not seen perfect.—Meissn. in DC. Prod. xiv. 147; *M. parvifolia*, Meissn. in Linnæa, xxvi. 362.

N. S. Wales, *Anderson, Vicary;* naked rocky margins of Fish river, *A. Cunningham;* Lord Howe's Island, *C. Moore.*

Victoria. Gravelly banks of the Mitta-Mitta, Maroka valley and Snowy river, *F. Mueller.*

Tasmania. Moist places in various parts of the colony, ascending to 4000 ft., *J. D. Hooker.*

This species is also in New Zealand.

5. **M. polybotrya,** *Meissn. in Pl. Preiss.* i. 623, *and in DC. Prod.* xiv. 145. Stems woody at the base, decumbent or ascending, 1 to 2 ft. long, rather stout and not much branched. Leaves oblong-lanceolate, acute, narrowed into a rather long petiole, the larger ones 2 to 3 in. long. Spikes interrupted, the males usually numerous and longer than the leaves, the females short. Male perianths about 1 line long, on rather long pedicels, females larger on shorter pedicels. Stigmas more or less fringed. Fruiting perianth scarcely thickened. Nut nearly globular, obscurely 3-angled. Seed with 6 prominent longitudinal obtuse angles separated by 3 deep and narrow, and 3 alternate shallow furrows. Embryos observed incumbently and accumbently incurved in different seeds from the same specimen.—F. Muell. Fragm. iv. 130, also named *Polygonum polybotryum.*

W. Australia. Swan river, *Drummond, Oldfield, Preiss, n.* 1353, and others.

6. **M. polygonoides,** *F. Muell. Fragm.* v. 73. A diffuse or erect undershrub or shrub, attaining several ft., with numerous branches elongated and leafy when young or luxuriant, clustered wiry and appearing sometimes almost leafless on old stems. Leaves linear or lanceolate, contracted at the base, rarely broad or occasionally hastately 3-lobed on luxuriant shoots, small and narrow on most flowering branches. Flowers small, very few together and the females often almost solitary, all axillary. Perianth under 1 line long when in flower, 1 to 1½ lines when in fruit but scarcely succulent. Style shortly 3-lobed, the stigmas at first somewhat dilated and entire, larger and lobed or fringed when fully out. Nut nearly globular, obtusely 3-angled, somewhat shining but often slightly rugose. Seed not furrowed.—*Polygonum diclinum*, F. Muell. in Hook. Kew Journ. viii. 203, and in Trans. Phil. Soc. Vict. i. 23: Meissn. in DC. Prod. xiv. 85; *Muhlenbeckia stenophylla*, F. Muell. Fragm. i. 138; *Polygonum angustissimum*, F. Muell. Fragm. v. 92.

N. S. Wales. Murray river near the mouths of the Murrumbidgee and Darling rivers, *F. Mueller.*

Victoria. Rocky mountains on the Macalister and Snowy rivers, *F. Mueller*; Wimmera, *Dallachy.*

7. **M. Cunninghamii,** *F. Muell. Fragm.* v. 91. A shrub, sometimes low and bushy, sometimes attaining 6 to 8 ft. or even taller, with numerous terete sulcate or angular branches, the young and luxuriant ones often with a few linear or linear-lanceolate leaves of 1 to 3 in. contracted into a rather long petiole, but most of the branches rigid or rushlike often clustered and either quite leafless or with a few linear leaves. Stipules deciduous. Flower-clusters solitary or in short spikes at the leafless nodes or in the axils of the small leaves forming long terminal interrupted spikes. Perianth rather above 1 line long. Style 3-branched, with broad peltate terminal stigmas more like those of a *Polygonum* than of a *Muhlenbeckia*, but the flowers quite diœcious. Nut prominently 3-angled, smooth and shining, enclosed in the ovoid slightly thickened perianth which is enlarged to from 1½ to 2 lines in length. Seed scarcely furrowed.—*Polygonum Cunninghamii*, Meissn. in Linnaea, xxvi. 364, and in DC. Prod. xiv. 85; *Muhlenbeckia florulenta*, Meissn. in Linnaea, xxvi. 362; *Polygonum junceum*, A. Cunn.; Lindl. in Mitch. Trop. Austr. 85.

N. Australia. Victoria river, *F. Mueller.*

Queensland. Rockhampton, *O'Shanesy*; Suttor river, *Bowman*; Bokhara Creek, *Leichhardt*; Curriwillighie, *Dalton*; Darling Downs, *Lau.*

N. S. Wales. Liverpool Plains, *Leichhardt, C. Moore*; Lachlan river, *A. Cunningham*; Macquarrie river, *Mitchell*; Murray and Darling rivers to the Barrier Range, *Victorian and other Expeditions.*

Victoria. Wendu Vale, *Robertson*; Melbourne, *Adamson*; Bacchus Marsh and Station Peak, *F. Mueller*; Creswick, *Whan.*

S. Australia. Murray river to St. Vincent's Gulf, *F. Mueller*; Salt Creek, *Behr*; Dombey Bay, *Wilhelmi*; towards Spencer's Gulf, *Warburton.*

W. Australia. Between Moore and Murchison rivers, *Drummond, 6th coll. n.* 218.

ORDER C. NYCTAGINEÆ.

Perianth simple, inferior, the lower portion persistent and enclosing the ovary and fruit, the upper portion variously shaped, with 5 rarely 4 angles folds teeth or lobes, deciduous or withering. Stamens either of the same number as the folds or teeth of the perianth or fewer or more, often inconstant in the same species, and never more than 20, inserted on (or united at the base with) a narrow or cupshaped disk more or less adnate to the stipes of the ovary within the perianth (or rarely free from the base?); filaments slender, usually exserted; anthers 2-celled, the cells attached back to back and opening longitudinally round the outer margin. Ovary shortly stipitate within the base of the perianth, 1-celled, with 1 erect anatropous ovule. Style terminal, simple, undivided, with a single stigma. Fruit 1-seeded, enclosed in the persistent tough or hardened base of the perianth which falls off with it having the appearance of a pericarp, the real

pericarp thin and membranous more or less adherent to and often inseparable from the equally thin testa of the seed. Embryo curved transversely folded or longitudinally convolute around or within a mealy albumen, radicle inferior.—Herbs shrubs or trees, the nodes often tumid and articulate. Leaves usually opposite, often unequal in each pair, rarely alternate, usually entire or scarcely sinuate. Flowers solitary clustered or umbellate, the bracts in many genera not Australian forming an involucre round them sometimes large and coloured, but often small, and in the Australian genera the bracts all very small and deciduous.

A small Order of which the genera are all American, and exclusively so with the exception of the two found in Australia, which are both of them widely dispersed over the tropical and subtropical regions of both the New and the Old World.

Herbs with small flowers. Upper portion of the perianth deciduous.
Stamens 1 to 4. Embryo folded . . . . 1. BOERHAAVIA.
Trees, shrubs, or woody climbers. Limb of the perianth persistent
on the fruit. Stamens usually 6 to 8. Embryo straight, cotyledons
convolute . . . . 2. PISONIA.

1. BOERHAAVIA, Linn.

Flowers hermaphrodite. Upper portion of the perianth campanulate or funnel-shaped, truncate and plicate or very shortly 5-lobed, falling off after flowering, leaving the lower portion persistent and enclosing the ovary and fruit. Stamens 1 to 4, usually exserted. Stigma dilated peltate or oblique. Fruit completely enclosed in the somewhat hardened 5-ribbed base of the perianth. Embryo transversely folded at the base of the cotyledons.—Herbs usually perennial. Leaves opposite.—Flowers small, in little clusters or umbels on simple or branched axillary peduncles. Bracts and bracteoles very small.

The genus is widely diffused over the tropical and subtropical regions of the New and the Old World. The Australian species are both Asiatic, one a common weed in Africa and Asia, the other perhaps confined to Asia; both, however, require further comparison with some of the American species.

Leaves orbicular or ovate to narrow-lanceolate. Deciduous portion of
the perianth campanulate, not exceeding 1 line . . . . 1. *B. diffusa.*
Leaves cordate-ovate to lanceolate. Deciduous portion of the perianth
3 to 4 lines long, funnel-shaped, with a narrow tube . . . . . . 2. *B. repanda.*

1. **B. diffusa,** *Linn. Chois. in DC. Prod.* xiii. ii. 452. A perennial with procumbent diffuse or ascending stems extending sometimes to several ft., the whole plant glabrous, or the lower portion and foliage pubescent or hirsute, with a few longer articulate hairs and sometimes glandular-viscid. Leaves of each pair unequal or nearly equal, petiolate, the lower ones often broadly ovate or orbicular ½ to 1 in. diameter, the upper ones usually smaller or narrower, sometimes nearly all narrow-lanceolate, from very obtuse to acute, entire sinuate or crisped on the margins especially when hirsute, the smaller ones sometimes clustered in the axils, the floral ones passing into minute bracts. Flowers very small, pale pink, sessile or on very short pedicels somewhat lengthened

under the fruits, in little heads or umbels on filiform peduncles more or less branched into compound umbels or irregular panicles axillary or terminal. Bracts under the pedicels small and lanceolate, with a pair of minute bracteoles under the perianth. Perianth constricted above the ovary, the lower portion about $\frac{1}{3}$ line long, rather thick, 5-ribbed, studded with stipitate glands, the upper deciduous portion campanulate, petal-like, scarcely lobed, from $\frac{3}{4}$ to rather above 1 line long. Stamens usually 3, sometimes 1, 2 or 4, inserted in a narrow cup-shaped toothed disk adnate to the stipes of the ovary, which as well as the whole ovary is entirely enclosed in the base of the perianth; filaments as long as or rather longer than the perianth. Fruiting base of the perianth oblong-turbinate, glandular-muricate when dry, becoming enveloped in mucilage in hot water, from 1 to nearly 2 lines long.—*B. mutabilis*, Br. Prod. 422, Chois. in DC. Prod. xiii. ii. 455, (there placed in a wrong division); Nees in Pl. Preiss. i. 622; F. Muell. Pl. Vict. ii. t. 67, (the insertion of the stamens and style incorrect); *B. pubescens*, R. Br. Prod. 422; *B. procumbens*, Roxb.; Wight, Ic. t. 874.

N. Australia. Victoria river, *F. Mueller;* Islands of the Gulf of Carpentaria, *R. Brown;* (glabrous, glandular pubescent and very villous-tomentose varieties), *Henne;* Adams Bay, *Hulls;* Port Essington, *Armstrong;* Port Darwin, *Schultz.*

Queensland. Keppel Bay, *R. Brown;* Port Molle and Isles off Cape Flattery, *M'Gillivray;* Howick's group, *F. Mueller;* Rockingham Bay, *Dallachy;* common about Rockhampton, *Dallachy* and others; Nerkool and Amity Creeks, &c., *Bowman;* Warwick, *Beckler;* on the Maranoa, *Mitchell* (some of the specimens very hirsute, with the leaves white underneath); Armadillo, *Barton;* Curriwillighie, *Dalton.*

N. S. Wales. Mudgee, *Woolls;* from the Darling river to the Barrier Range, *Victorian and other Expeditions;* New England, *C. Stuart.*

Victoria. Murray river, Mount Hope, *F. Mueller.*

S. Australia. Spencer's Gulf, *R. Brown;* Flinders Range, Taberton, *F. Mueller;* Cooper's Creek, *Howitt's Expedition.*

W. Australia. Swan river, *Drummond, Preiss, n.* 2389; Murchison river, *Oldfield;* Port Walcott, *Harper.*

The glabrous and hirsute states are generally found in the same localities, the former, however, by far the most frequent. The species is a common weed in the warmer regions of Asia and Africa.

2. **B. repanda,** *Willd.; Chois. in DC. Prod.* xiii. ii. 455. A stouter and coarser plant than *B. diffusa*, usually glabrous and spreading. Leaves petiolate, cordate-ovate or lanceolate, usually acuminate, the margins undulate, rather thick, often above 1 in. long, but sometimes small. Flowers pedicellate in umbels on axillary or terminal peduncles and very frequently with a whorl of 6 to 8 pedicellate flowers at some distance from the terminal umbel. Pedicels 2 to 6 lines long, or more usually unequal in the same umbel, not so slender as in *B. diffusa*. Lower portion of the perianth under 1 line long, glandular muricate as in *B. diffusa*, upper deciduous portion funnel-shaped, 3 to 4 lines long, the slender part of the tube as long as the campanulate summit. Stamens usually 2 or 3, sometimes 4, exserted. Fruit considerably longer than in *B. diffusa*.—Wight, Ic. t. 1766.

Queensland. Lady Elliott's Island, *Capt. Robertson.*

W. Australia. Sharks Bay, *Milne*, *Maitland Brown*; between Moore and Murchison rivers, *Drummond*, *6th coll. n.* 217.

The species has a considerable range in East India, the Indian Archipelago, &c., chiefly in maritime districts.

2. PISONIA, Linn.

Flowers hermaphrodite or unisexual. Perianth in the hermaphrodite flowers contracted above the ovary, in the males campanulate, in the females ovoid or cylindrical, the margin in all 5-angled or 5-toothed. Stamens usually 6 to 8, longer than the perianth, none in the female flowers. Ovary entirely wanting or imperfect in the male flowers. Stigma in the females dilated, oblique. Fruiting perianth oblong or elongated, 5-ribbed, smooth or glandular-muricate, crowned by the small withered limb of the perianth. Seed oblong with a deep longitudinal furrow. Albumen scanty. Embryo straight, the cotyledons convolute over the intruded testa.—Trees shrubs or woody climbers. Leaves opposite or scattered. Flowers in dense or loose cymes, often arranged in terminal panicles. Bracts and bracteoles very small or none.

The species are numerous in tropical and subtropical America, but there are also a few in southern Asia and in the island region from the S. African coast to the Pacific. Of the three Australian species one is widely spread over the tropical regions both of the New and the Old World, another extends to Norfolk Island and New Zealand, and possibly to some of the islands of the Eastern Archipelago and South Pacific, the third may be endemic, but closely resembles if it be not identical with a Pacific island species, the synonymy, however, notwithstanding the researches of Seemann, remains exceedingly confused, and the specimens now in our herbaria are wholly insufficient to clear it up.

Tall woody climber with axillary spines. Flowers unisexual. Fruiting perianth muricate . . . . 1. *P. aculeata.*
Unarmed trees.
  Flowers unisexual. Perianth shortly villous, muricate when in fruit . . . . 2. *P. inermis.*
  Flowers (all ?) hermaphrodite. Perianth glabrous, elongated and smooth or minutely papillose-scabrous when in fruit . . . . 3. *P. Brunoniana.*

1. **P. aculeata,** *Linn.*; *Chois. in DC. Prod.* xiii. ii. 440. A tall woody climber, forming impenetrable masses on the borders of forests, reduced to a low straggling bush in open places, glabrous or rarely pubescent, often armed with stout recurved axillary prickles (abortive peduncles). Leaves opposite or here and there alternate, petiolate, ovate, often broad, or rarely oblong or lanceolate, obtuse, entire, rarely exceeding 3 in. and often all under 2 in. long. Flowers diœcious, in small dense cymes or globular clusters, of which several are usually collected into small panicles in the upper axils, the common peduncle rarely exceeding the leaves and often very short. Male perianths shortly pedicellate, campanulate, shortly and broadly 5-toothed, the bud clavate and prominently 5-angled at the top, opening to about 2 lines diameter. Female perianths nearly sessile, ovoid, about 1 line long, obscurely 5-toothed, enclosing the ovary, the style shortly protruding, with a deeply lobed or fringed stigma. Fruits in loose cymes forming often large

panicles, the pedicels lengthening to above $\frac{1}{2}$ in., the enlarged perianth oblong or linear-clavate, $\frac{1}{4}$ to $\frac{1}{2}$ in. long, 5-ribbed, glandular-muricate.—Wight, Ic. t. 1763, 1764; *P. villosa*, Poir.; Chois. in DC. Prod. xiii. ii. 440; *P. limonella*, Blume; Chois. l.c. 446.

Queensland. Cape York, *Daemel;* Burdekin river, *Fitzalan;* Edgecombe and Rockingham Bays, *Dallachy;* Broad Sound and Nerkool Creek, *Bowman;* Rockhampton, *O'Shanesy.*

N. S. Wales. Clarence river, *Beckler;* Tweed river, *C. Moore.*

The species is very widely distributed over the tropical regions of the New and the Old World, especially in maritime districts.

2. **P. inermis,** *Forst. Prod.* 75. A tall tree, glabrous except the inflorescence. Leaves petiolate, ovate or oblong, acuminate or almost obtuse, rounded or narrowed at the base, often 6 to 8 in. long. Flowers diœcious, small, collected in small cymes forming a terminal corymbose rather compact panicle, usually shortly pedunculate and much shorter than the leaves. Perianths both male and female narrow, ovoid-oblong, scarcely 2 lines long at the time of flowering the males rather longer and more dilated at the orifice than the females, all pubescent or villous. Stamens shortly exserted. Style scarcely protruding from the females. Fruiting perianths in a loose panicle on more or less elongated pedicels, the perianth about $\frac{1}{2}$ in. long, very prominently muricate along the angles.—*P. grandis*, R. Br. Prod. 422; Chois. in DC. Prod. xiii. ii. 441; Endl. Iconogr. t. 30.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown.*

Queensland. Northumberland islands, *R. Brown;* Rockingham Bay, *Dallachy.*

The species is also in the Pacific islands, for, as far as can be judged from Forster's specimens and from the description quoted by Guillemin as mentioned below, the Taitian and the Australian plant appear to be identical. I have therefore followed Seemann in restoring to it Forster's name, the previously published *P. inermis*, Jacq. being referred by Choisy to *P. nigricans*, Sw., by Seemann to *P. mitis*, Linn.

3. **P. Brunoniana,** *Endl. Prod. Fl. Norf.* 43, *but not of Chois.* A tree attaining sometimes a great height, quite glabrous or the inflorescence minutely pubescent, but never so much so as in *P. inermis.* Leaves mostly opposite, the upper ones sometimes irregularly alternate or approximate so as to appear verticillate, petiolate, from broadly ovate to obovate elliptical or almost oblong, obtuse, contracted or rarely rounded at the base, often 8 in. long or even more, but sometimes not half that size, somewhat coriaceous when old. Flowers mostly hermaphrodite, although the ovary in some individuals and the stamens in others may be imperfect or less perfect, all shortly pedicellate in small cymes collected into terminal leafless panicles. Perianth when fully out usually about 3 lines long, funnel-shaped, the tube distinctly contracted above the ovary when that is perfect, scarcely so when it is more or less abortive, expanded and obscurely lobed at the top. Stamens usually shortly exserted. Fruiting perianth narrow and above 1 in. long, more or less 5-angled, glabrous and smooth or the angles slightly papillose or tubercular, contracted upwards into a narrow neck crowned by the withered

border of the perianth.—Hook. f. Handb. N. Zeal. Fl. 229; *P. Sinclairii*, Hook. f. Fl. N. Zeal. i. 209, t. 50; *P. Mooriana*, F. Muell. Fragm. i. 20.

Queensland. Rockingham Bay, *Dallachy*.

N. S. Wales. Richmond river, *Richards*, *Henderson;* Illawarra, *A. Cunningham*, *C. Moore;* also Sydney woods, Paris Exhibition, 1855, *Macarthur*, *n.* 197.

The species is also in Norfolk island and New Zealand, all other stations doubtful, for the identification of the Australasian and Polynesian specimens of *Pisonia* is often impossible from their incompleteness. The foliage affords no marks, and the flowers and fruits are often mismatched. Choisy in DC. Prod. xiii. ii. 441, has described as *P. Brunoniana* the Pacific island *P. procera*, Bert., figured in Deless. Ic. Sel. iii. t. 87, and (as *P. Forsteriana*) in Pl. Meyen. t. 51, a species not unlike the *P. Brunoniana* when seen in fruit, but with very different flowers, these being diœcious in all the specimens I have seen, the male perianth campanulate and prominently 5-lobed, the female perianth much smaller and ovoid-oblong. This has been correctly identified by Seemann with the *Ceodes umbellifera*, Forst., and if Horsfield's specimens are rightly determined, with *P. excelsa*, Blume, a name which under all the circumstances ought, I think, to have the preference over *P. umbellifera*, Seem.; nor can I agree with Seemann in referring to it the Australian plant. With regard to the Norfolk Island and New Zealand species which Seemann separates from the Australian one and refers to *P. inermis*, Forst., he has been evidently misled by Guillemin, who Zeph. Tait. in Ann. Sc. Nat. Sér. 2, vii. 191, having before him only the *P. procera*, Bert. (*Ceodes*, Forst.) refers to it Forster's manuscript description of *P. inermis*, Forst.

ORDER CI. MYRISTICEÆ.

Flowers diœcious, regular. Perianth deciduous, 3-lobed or rarely 2- or 4-lobed, the lobes valvate in the bud. Male fl. Stamens united in a central column; anthers 3, 6, or more adnate to the column at the apex, or in a ring immediately below the column, each with 2 parallel cells opening longitudinally. Female fl. Ovary free within the perianth, with a single erect anatropous ovule; stigma sessile or nearly so, capitate or depressed. Fruit succulent, opening tardily in 2 valves. Seed erect, sessile, more or less covered with a lobed or jagged often scarlet arillus (or arillodium) proceeding from the base of the seed. Albumen remarkably ruminate. Embryo very small, at the base of the seed, with divaricate cotyledons.—Trees, often aromatic. Leaves alternate, entire, usually dotted, penniveined, without stipules. Flowers small, in axillary or supra-axillary racemes or panicles, more numerous in the males than in the females. Bracts minute or none.

The Order is limited to the single genus *Myristica*.

1. MYRISTICA, Linn.

Characters those of the Order.

The genus is entirely tropical, most abundant in the Eastern Archipelago, with a few species from Continental India or from the Mascarene and South Pacific islands, and several from tropical America. The only Australian species may be endemic, but is closely allied to an Indian one.

1. **M. insipida,** *R. Br. Prod.* 400. A fine tree of 60 to 70 ft. or more (*Dallachy*), glabrous but the young branches and petioles often ferru-

ginous. Leaves oval-elliptical or oblong, shortly acuminate, rounded or cuneate at the base, all under 4 in. long in some specimens, all above 6 in. in others, and often very variable in size and relative breadth on the same specimens, pale and shining above with the veins impressed, more or less glaucous underneath, with from 7 to 20 prominent primary veins on each side of the midrib. Male flowers few or rather numerous, in sessile axillary clusters. Pedicels shorter than the perianth, with a small broad ciliolate bract close under the flowers. Perianth cylindrical, 2 to 2½ lines long, with 3 lobes scarcely above ½ line long. Staminal column included, not dilated at the top; anthers 6, linear, adnate in a ring below the top of the column and occupying ⅔ of its length. Female flowers not seen. Fruits solitary or 2 together on very short thick axillary pedicels, ovoid or ovoid-oblong, about 1 in. long, rusty-tomentose or nearly glabrous. Seeds normal; embryo with very small thick divaricate cotyledons quite entire.—A. DC. Prod. xiv. 206; *M. cimicifera,* R. Br. Prod. 400; A. DC. l.c. 191.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* Brunswick Bay, *A. Cunningham;* Melville island, *Fraser;* Port Essington, *Armstrong.*

Queensland. Endeavour river, *Banks and Solander;* Albany island, *W. Hill;* Rockingham Bay, *Dallachy;* near Rockhampton, *Thozet.*

The species is very near to *M. Zeylanica,* A. DC., united by Thwaites with *M. laurifolia,* Hook. f. and Thoms. from Ceylon, and is indeed scarcely to be distinguished from it, as far as our specimens show, but by the narrower perianth and apparently fewer anthers.

ORDER CII. MONIMIACEÆ.

Perianth regular, usually at first globular or nearly so and more or less adnate to or continuous with the expanded receptacle or staminal disk, the limb of 4 or more connivent lobes or segments in 2 or rarely more rows but all of similar texture, calycine or scarcely petaloid, deciduous or persistent. Stamens either definite and opposite the perianth-segments or more frequently indefinite and irregularly arranged in several rows; filaments very short; anthers adnate, usually extrorse, the cells opening in separate valves or in longitudinal slits, either distinct or confluent at the apex. Gynœcium of several carpels, free and distinct, rarely reduced to a single one, each with a single ascending or pendulous anatropous ovule. Style terminal, usually oblique excentrical or almost lateral, filiform or very short or almost none, with a small or pulvinate terminal stigma. Fruit of several (or rarely only one) 1-seeded drupes or nuts, resting on the expanded receptacle or persistent portion of the perianth-tube or enclosed in the enlarged perianth. Seed with a membranous testa and fleshy albumen. Embryo usually very small, with divaricate or appressed cotyledons and a short or long radicle next the hilum.—Trees shrubs or woody climbers, usually glandular-dotted and aromatic. Leaves opposite, entire or toothed, without stipules. Flowers solitary or in trichotomous cymes or definite raceme-like or thyrsoid panicles, axillary or rarely terminal. Bracts usually very small.

The Order is chiefly South American, tropical with a few extratropical species, and is also represented in the Mascarene islands and more sparingly in tropical Asia, New Zealand, and the islands of the South Pacific. Of the eight Australian genera one is specially American, another is Asiatic, a third is represented in New Zealand and extratropical South America, a fourth in New Zealand and the South Pacific, and the remaining four are endemic.

Anther-cells distinct, opening each in a separate valve from the base upwards.
- Ovule ascending. Peduncles short with 1 or 3 rather large flowers. Style bearded and persisting.
  - Flowers hermaphrodite. Anther-connective with a long subulate appendage . . . . 1. DORYPHORA.
  - Flowers unisexual. Anther-connective not produced . . . 2. ATHEROSPERMA.
- Ovule pendulous. Flowers hermaphrodite, small, in thyrsoid panicles. Anther-connective not produced . . . . 3. DAPHNANDRA.

Anther-cells opening longitudinally and confluent in a single reniform or horse-shoe cell. Flowers unisexual, small. Ovule pendulous. Perianth 4-lobed.
- Stamens indefinite, few or numerous, irregularly lining the perianth-tube. Flowers usually diœcious . . . . 4. MOLLINEDIA.
- Stamens 4 opposite the perianth-lobes, with frequently 1 to 3 smaller ones within. Flowers usually monœcious . . . . . 5. KIBARA.

Anthers, at least the outer ones, with 2 distinct cells opening longitudinally. Flowers unisexual or polygamous.
- Carpels numerous. Anthers almost sessile.
  - Fruiting-perianth circumsciss or expanding under the carpels and scarcely enlarged . . . . 6. HEDYCARYA.
  - Fruiting-perianth enlarged, irregularly globular, completely enclosing the carpels. Climber . . . . 7. PALMERIA.
- Carpels solitary. Filaments filiform, nearly as long as the anthers. Climber . . . . 8. PIPTOCALYX.

1. DORYPHORA, Endl.

(Learosa, *Reichb.*)

Flowers hermaphrodite. Perianth-tube campanulate, segments 6 in 2 rows. Stamens usually 6 perfect, opposite the perianth-segments round the orifice of the tube, with 6 to 12 staminodia within them; filaments short, with a wing-like appendage on each side, anthers extrorse, with 2 distinct cells opening from the base upwards in convex valves, the connective produced into a long linear-subulate appendage. Carpels several at the base of the tube with one ascending ovule in each. Style long, slightly lateral. Fruiting carpels included in the persistent perianth-tube, the segments deciduous, each carpel growing out laterally so that the long plumose style appears almost basal. Seed not seen perfect.—Tree. Leaves toothed. Flowers 3 together on short axillary peduncles. The whole plant highly aromatic.

The genus is limited to a single species endemic in Australia.

1. **D. sassafras,** *Endl. Iconogr.* t. 10. A tree of considerable size but of irregular growth, glabrous except the inflorescence or the young shoots hoary-tomentose. Leaves petiolate, ovate elliptical or oblong-lanceolate, acuminate, coarsely toothed, narrowed at the base, 2 to 4 in.

long, nearly smooth on the upper side, prominently penniveined and reticulate underneath. Peduncles 2 to 3 lines long, with a pair of very deciduous bracts of 3 or 4 lines close under the flowers. Perianth-tube about 1 line long when in flower, enlarged and irregularly split when in fruit, segments about 4 lines long, lanceolate, very acute. Anther-appendages nearly as long as the perianth-segments. Carpels slightly hairy, the styles lengthening after fecundation into long plumose awns.—Tul. Monogr. Monim, 424; A. DC. Prod. xvi. ii. 676; Baill. Hist. Pl. i. 318, fig. 357 to 359.

N. S. Wales. Port Jackson to the Blue Mountains, *Woolls* and others; Clarence river, *Beckler;* Manning river, *C. Moore;* southward to the Illawarra, *A. Cunningham, Ralston.*

Although the embryo has been described by Endlicher in his Genera Plantarum, it is doubtful whether he had seen it, for throughout that work the tribual characters are repeated under each genus without having always verified them in each case, and the seed is not figured in his above-quoted Icones. In the 2nd Suppl. to the Genera, p. 35, he proposes to substitute the name of *Learosa* (Reichb. Nomencl. 2612, a work I can find no record of) for *Doryphora*, the latter being pre-engaged by Zoologists, a plea now considered insufficient for changing a botanical name.

2. ATHEROSPERMA, Labill.

Flowers diœcious. Perianth-tube campanulate, lobes 8 or rarely 10 in 2 rows. Stamens usually from as many to twice as many as perianth-lobes, without staminodia in the males; filaments flat, with a wing-like appendage on each side; anthers short, extrorse, with 2 distinct cells opening from the base upwards in convex valves, the connective truncate. Carpels in the females numerous in several rows, the outer ones imperfect, the inner ones with one erect ovule in each and tapering into long styles. Fruiting perianth-tube persistent, slightly enlarged, enclosing numerous narrow dry carpels, the long persistent terminal plumose styles exserted, the lobes deciduous. Pericarp and testa of the seeds thin; albumen fleshy. Embryo very small, with short erect cotyledons.—Trees. Leaves toothed or entire. Flowers axillary, in the Australian species solitary, in others in cymes of 3 to 7. The whole plant highly aromatic.

Besides the Australian species which is endemic, the genus comprises one from New Zealand, and (if *Laurelia* be regarded as a true congener) one from extratropical S. America.

1. **A. moschata,** *Labill. Pl. Nov. Holl.* ii. 74, t. 224. A tree attaining a large size, the young branches tomentose. Leaves ovate elliptical oblong or lanceolate, acute, coarsely and irregularly toothed or entire, contracted into a rather short petiole, 1½ to 3 in. long, coriaceous, glabrous above, glabrous glaucous or white-tomentose underneath, the primary somewhat branched veins alone conspicuous. Flowers solitary on axillary peduncles of ¼ to ½ in. long, at length recurved. Bracts 2, close under the flower, ovate, acute, 4 or 5 lines long, silky inside and out, very deciduous. Male perianth-tube ovate-campanulate, about 3

lines long, silky outside, glabrous inside, the lobes 4 to 5 lines long, the outer ones broader than the inner. Stamens about 12, inserted round the top of the tube in about 3 rows, without staminodia or imperfect carpels. Female perianth with rather smaller more silky lobes than the males, the tube broader and villous inside. Carpels very numerous, villous, lining the whole disk and tube in numerous rows, the two or three outer rows abortive, considered by some as staminodia, but with the shape and hairs of the carpels and tapering into a minute glabrous rudimentary style, the numerous inner carpels with elongated styles. Fruiting perianth with a persistent broadly campanulate tube 4 or 5 lines diameter, the lobes deciduous, but the outer abortive carpels somewhat enlarged and assuming the appearance of 2 or 3 rows of teeth to the perianth.—A. DC. Prod. xvi. ii. 676; Baill. Hist. Pl. i. 320, f. 360 to 364; Hook. f. Fl. Tasm. i. 12; F. Muell. Pl. Vict. i. 24.

Victoria. Rare in dense swampy forest gullies towards Cape Otway, more frequent at the sources of the Yarra in the Dandenong ranges, and in the southern part of Gipps' Land, *F. Mueller.*

Tasmania. Common in Beech forests throughout the island, *J. D. Hooker.*

3. DAPHNANDRA, Benth.

Flowers hermaphrodite. Perianth-tube short, segments about 15 in about three rows. Stamens 4 or 5, opposite the inner segments; filaments flat, with a wing-like appendage on each side; anthers short, extrorse, with 2 distinct cells opening from the base upwards in convex valves, the connective truncate; staminodia (or abortive carpels?) 5 to 12 between the stamens and carpels. Carpels several in 2 or 3 rows with one pendulous ovule in each, and tapering into the style. Fruit unknown.—Tree. Leaves serrate. Flowers small, in axillary thyrsoid panicles.

The genus is limited to a single species, endemic in Australia. With the stamens of *Atherosperma* it has the inflorescence and pendulous ovules of *Mollinedia*, and the plant cannot well be associated with either, although in the absence of fruit, the generic character is as yet incomplete.

1. **D. micrantha,** *Benth.* A handsome tree of moderate size, quite glabrous or the young inflorescence minutely hoary. Leaves petiolate, oblong-lanceolate or elliptical, acuminate, more or less serrate, contracted at the base, 3 to 4 in. long, green on both sides, the primary veins oblique and anastomosing. Panicles shorter than the leaves, the flowers not numerous. Bracts scarcely 1 line long, very deciduous. Perianth-tube short and broad, outer segments broad, about 1 line diameter, inner ones narrower and more petal-like. Stamens not exceeding the perianth. Carpels of the ovary glabrous or slightly hairy, sessile in the hairy receptacle.—*Atherosperma micranthum*, Tul. Monogr. Monim. in Archiv. Mus. Par. viii. 421, t. 34; Alph. DC. Prod. xvi. ii. 676.

Queensland. Moreton Bay, *Fraser*, *W. Hill.*

N. S. Wales. Clarence, Richmond, and Lansdowne rivers, *C. Moore.*

4. **MOLLINEDIA,** Ring and Pav.

Flowers unisexual, usually diœcious. Perianth ovoid globular or turbinate, nearly closed by 4 short connivent lobes or rarely, in species not Australian, more deeply divided and spreading. Stamens in the males indefinite, few or many, irregularly lining the inside of the perianth-tube; anthers sessile or nearly so, the cells confluent at the apex and opening longitudinally round the apex and to the base on each side, without staminodia or abortive carpels. Female perianth circumsciss after flowering; staminodia none. Carpels usually numerous, covering the receptacle in many rows, with one pendulous ovule in each; style very short and obtuse or the stigma sessile. Fruiting carpels several, ovoid, drupaceous, sessile or stipitate on the expanded receptacle. Seed with a fleshy albumen; embryo small, with small erect cotyledons, the radicle superior.—Trees or shrubs. Leaves entire or toothed. Flowers small, in axillary lateral or almost terminal cymes or thyrsoid panicles. Bracts very small.

The genus is rather numerous in tropical America, but unknown elsewhere besides the Australian species, which are endemic.

Leaves coriaceous, much reticulate underneath, the petioles short. Young parts often pubescent. Ovary and young fruits villous .	1. *M. Huegeliana.*
Leaves membranous or chartaceous, obtuse, the veins scarcely prominent. Petioles rather long. Flowers and fruit glabrous . .	2. *M. Wardellii.*

Species insufficiently known.

Leaves nearly of *M. Wardellii.* Stamens unknown. Carpels of the fruit obtusely and obliquely acuminate	3. *M. loxocarya.*
Leaves nearly of *M. Wardellii,* but acutely acuminate. Stamens crowded on the disk. Fruit unknown	4. *M. acuminata.*

1. **M. Huegeliana,** *Tul. in Ann. Sc. Nat. Sér.* 4. iii. 45, *and in Archiv. Mus. Par.* viii. 399. A small tree, the young shoots inflorescence and underside of the leaves usually pubescent. Leaves on short petioles, ovate-elliptical to oblong-lanceolate, obtuse or shortly acuminate, entire or bordered by short rigid teeth, rounded or rarely acute at the base, mostly 3 to 4 in. long, but varying to short and broad or long and narrow, more coriaceous and shining above than other species, strongly reticulate. Flowers apparently diœcious, in little cymes or thyrsoid panicles very short and sessile or nearly so in the axils, pedicels rather long in the males with a very short common peduncle, the pedicels shorter in the females with a longer peduncle or rhachis, almost forming a few-flowered raceme of about an inch. Male perianth glabrous, nearly globular, about 1 line diameter, the small orifice almost closed by 4 minute broad lobes, 2 inside the 2 others and 1 or 2 outer lobes (or adnate bracts ?) opposite the inner ones. Stamens 8 to 14, irregularly lining the perianth as in American *Mollinediæ.* Female perianth larger, very villous inside, circumsciss after flowering. Carpels numerous and villous. Drupes sessile on the base of the perianth or disk, expanded to a diameter of 3 or 4 lines, ovoid-globose, ½ in. long, pubescent or at length glabrous.—*Wilkiea Huegeliana,* A. DC. Prod. xvi. ii. 669.

Queensland. Brisbane river, Moreton Bay, *A. Cunningham*, *Fraser*, *F. Mueller*.
N. S. Wales. Hastings river, *Beckler*; Richmond river, *Henderson*; Cook's river, *U. S. Exploring Expedition*; Kiama, *Harvey*.

The female and fruiting specimens are, when glabrous, very difficult to distinguish from those of *Kibara macrophylla*. The stamens are very different. It is this species that F. Mueller alludes to under *Wilkiea calyptrocalyx*, Fragm. v. 3, as having as many as 13 stamina.

2. **M. Wardellii,** *F. Muell. Fragm.* v. 155. A glabrous shrub. Leaves ovate elliptical or obovate-oblong, obtuse, obscurely crenulate, contracted into a rather long petiole, mostly about 2 in. long, but varying from 1½ to 3 in., of a much thinner consistence than in *M. Huegeliana*, and the primary veins scarcely conspicuous. Panicles thyrsoid, loose, often as long as the leaves. Pedicels 2 to 3 lines long. Male perianth obovoid, globular, 1½ lines diameter, with 4 short broad connivent lobes. Stamens 15 to 20, irregularly lining the perianth as in the American *Mollinediæ*. Female flower not seen. Fruiting perianth circumsciss, the carpels or drupes ovoid-globular, obtuse, glabrous, 4 to 5 lines long, very shortly stipitate on the flat expanded perianth-base or disk.—*Wardellia paniculata*, F. Muell. l.c.

Queensland. Rockingham Bay, *Dallachy*.

3. **M. ? loxocarya,** *Benth.* A glabrous shrub, apparently very nearly allied to *M. Wardellii*, the branches often compressed under the leaves as in *Kibara macrophylla*. Leaves elliptical-oblong, contracted into a rather long petiole as in *M. Wardellii* and of the same consistence, obtuse or shortly acuminate, quite entire, 3 to 4 in. long. Flowers not seen. Fruiting panicles 1½ to 2 in. long, resembling those of *M. Wardellii*, but with a pair of small leaves under the first pair of peduncles and the carpels or drupes closely sessile, ovoid and shortly obliquely and obtusely acuminate.

Queensland. Rockingham Bay, *Dallachy*.

4. **M. ? acuminata,** *F. Muell. Fragm.* v. 155. A small tree, quite glabrous or the inflorescence slightly pubescent. Leaves ovate-lanceolate or elliptical, acutely acuminate, contracted into a rather long petiole, entire or obscurely and irregularly denticulate, 2 to 3 in. long, rather thinner even than in the last two species but not seen in an old state. Panicles thyrsoid, shorter than the leaves, axillary or terminal. Flowers small and drying black as in the Australian *Mollinediæ*. Male perianth glabrous, depressed-globular, about 1½ lines diameter, with 2 short broad bracteoles sometimes adnate at the base; lobes 8 in 2 rows, the 4 outer ones orbicular and much imbricate, the 4 inner narrower and almost valvate. Anthers rather numerous, nearly sessile, occupying the whole disk or with a few abortive hairy carpels in the centre; the outer ones with 2 parallel dorsal cells opening longitudinally as in *Hedycarya*, the inner ones with the cells confluent at the apex as in *Mollinedia*. Female flowers and fruits unknown.

Queensland. Rockingham Bay, *Dallachy*.

This plant, with the habit and general aspect nearly of *M. Wardellii*, is evidently not a congener, the perianth and andrœcium being much nearer to, although certainly not identical with, those of *Hedycarya*. In the absence, however, of female flowers and fruits its real genus cannot be determined, and I have therefore refrained from giving it a new name to be rejected hereafter as another superfluous synonym.

5. **KIBARA,** Endl.

(Brongniartia, *Blume;* Sciadicarpus, *Hassk.;* Sarcostigma, *Griff.;* Wilkiea, *F. Muell.*)

Flowers unisexual, usually monœcious. Perianth ovoid globular or hemispherical, nearly closed by 4 short connivent lobes or teeth, usually (but not in all species) inflexed, or thickened inside in the females. Male fl. Stamens 4 opposite the perianth-lobes, the filaments flattened and more or less adnate to the tube, and above their union either distinct or united in a cup or ring, always shorter than the perianth, and usually 1, 2, or 3 shorter stamens within the four; anther-cells confluent in a single terminal cell opening longitudinally. No rudimentary carpels. Female perianth circumsciss. Staminodia none (unless the thickened interior of the perianth-lobes be regarded as such). Carpels several, often numerous, with 1 pendulous ovule in each. Style short and obtuse. Fruiting carpels several, ovoid, drupaceous, sessile or stipitate on the expanded receptacle. Seed with a fleshy albumen; embryo small, with small erect cotyledons, the radicle superior.—Trees or shrubs. Leaves entire or acutely toothed. Flowers small, in axillary or lateral cymes or panicles. Bracts very small.

Besides the Australian species, which are endemic, the genus comprises one or perhaps 3 or 4 from the Malayan Peninsula and the Indian Archipelago. Tulasne indicated its close affinity to *Mollinedia*. Baillon, in uniting it with that genus, adds also *Matthæa*, Blume, which I have not seen, but which, if Blume's figure is correct, appears nearer to *Hedycarya* in the insertion and form though not in the number of stamens. The fruits of *Mollinedia*, *Kibara*, and *Hedycarya* supply no generic distinctive characters.

Flowers and the whole plant glabrous.
  Leaves narrow, rigidly coriaceous. Petioles short. Inflorescence very short. Pedicels 2 to 3 lines long . . . . 1. *K. macrophylla.*
  Leaves broad, thinly coriaceous. Inflorescence loose. Pedicels 1 in. long or more . . . . 2. *K. longipes.*
Inflorescence and often the foliage pubescent.
  Panicles loose. Carpels stipitate . . . . 3. *K. laxiflora.*
  Panicles short. Carpels sessile . . . . 4. *K. pubescens.*

1. **K. macrophylla,** *Benth.* A tree of considerable size, perfectly glabrous in all its parts. Leaves on very short petioles, oblong or oblong-lanceolate, shortly acuminate, bordered by short pungent-pointed teeth or almost or quite entire, cuneate rounded or cordate at the base, rigidly coriaceous, shining and reticulate. Inflorescence simple or branched, axillary, very short, rarely above $\frac{3}{4}$ in. long. Pedicels slender, 2 to 3 lines long, with a small bract close under the flower. Perianth globular, quite glabrous, about 1 line diameter, the females with a minute orifice very minutely 4-toothed with thick reflexed fleshy

[illegible]
[illegible] [illegible]calyce

glands (points of the lobes? or staminodia?) inside, the males rather less closed and not thickened. Stamens in the males 4 opposite the lobes, shortly free, with very short broad filaments, and 1 or 2 smaller ones inside. Carpels in the females 12 to 15, perfectly glabrous, with broad thick flat sessile stigmas. Drupes closely sessile, ovoid, smooth and glabrous, about ½ in. long.—*Hedycarya macrophylla*, A. Cunn. in Ann. Nat. Hist. Sér. 1, i. 215; *Mollinedia macrophylla*, Tul. in Ann. Sc. Nat. Sér. 4, iii. 45, and in Archiv. Mus. Par. viii. 401; *Wilkiea calyptrocalyx*, F. Muell. in Trans. Phil. Inst. Vict. ii. 64 and Fragm. v. 3 (partly); *W. macrophylla*, A. DC. Prod. xvi. ii. 669.

Queensland. Endeavour river, *A. Cunningham;* Brisbane river, Moreton Bay, *A. Cunningham*, *F. Mueller*, and others; Rockhampton, *Dallachy*, *Thozet*, *O'Shanesy*.
N. S. Wales. New England, *C. Stuart.*

The fruiting specimens sometimes resemble some nearly glabrous forms of *Mollinedia Huegeliana*, with which F. Mueller unites this and the three following species as varieties of one *Wilkiea calyptrocalyx*.

2. **K. longipes,** *Benth.* A tree of considerable size, perfectly glabrous in all its parts. Leaves elliptical oblong or ovate, shortly acuminate, entire or with a few irregular teeth, acute at the base, 4 to 8 in. long, smooth and somewhat shining but much thinner than in *K. macrophylla*. Peduncles slender, axillary or supra-axillary, divaricately branched, forming loose panicles often half as long as the leaves and very broad. Pedicels often 1 in. long, slightly thickened upwards. Bracteoles 1 or 2, minute, close under the perianth. Flowers monœcious, the males and females in the same panicle, and the latter much the more numerous in our specimens. Perianths nearly globular, 1 to 1½ lines diameter, the males with 4 connivent lobes, the 2 outer broader than the 2 inner, and not thickened inside; females with a small orifice closed by 4 small lobes, 2 outer and 2 inner, each with a thick reflexed gland-like scale inside. Stamens 4, more or less connate, with 1 or 2 small ones inside. Carpels in the females 11 to 13, oblong, conical, pubescent, with small glabrous stigmatic tips. Perianth circumsciss after flowering. Drupes ovoid, about ½ in. long, glabrous or smooth, very shortly stipitate on the expanded disk or base of the perianth.

Queensland, *Dallachy.* Very closely allied to, but perhaps really distinct from the Malayan *K. coriacea.*

3. **K. laxiflora,** *Benth.* A small tree, the young branches and foliage more or less pubescent. Leaves elliptical or oblong, acuminate or obtuse, rounded or acute at the base, entire or slightly toothed, 2 to 4 in. long. Panicles axillary or from leafless nodes, trichotomous and loose, but usually shorter than the leaves, the males more branched and with more flowers than the females, but sometimes both sexes in the same panicle. Pedicels 2 to 4 lines long, bearing often a small bract at some distance from the flower. Male perianth depressed-globular, 1 to 1¼ lines diameter, the orifice almost closed by 4 small lobes. Stamens 4, united in a broad fleshy cup or tube, pubescent inside, without any additional inner stamens in the flowers examined.

Female perianth similar to the male, but twice the size, with a more minute orifice, and circumsciss after flowering, neither male nor female with any inflexed point or scale within the lobes. Carpels above 30, hispid, with short glabrous stigmatic styles, connivent and almost coherent at the tips. Drupes nearly globular or shortly ovoid, nearly ½ in. long, distinctly stipitate on the expanded disk or base of the perianth.

Queensland. Rockingham Bay, *Dallachy.*

4. **K. pubescens,** *Benth.* A tree, the branches inflorescence and young foliage more or less pubescent, the older leaves often glabrous or nearly so. Leaves from broadly ovate-elliptical to oblong-lanceolate, obtuse or shortly and obtusely acuminate, shortly and rigidly toothed or nearly entire, rounded at the base, becoming at length coriaceous with the veins prominent underneath, 2 to 4 in. long, on petioles of ¼ to ½ in. Flowers in small cymes or clusters sometimes lengthened into short thyrsoid panicles, which are sessile or pedunculate, but usually scarcely ¼ so long as the leaves. Pedicels 2 to 3 lines long. Bracts adnate to the perianth. Perianth about 1 line diameter, nearly globular, the orifice closed with 4 small lobes, thin in the males, thickened inside in the females. Stamens 4 opposite to the perianth lobes, the filaments shortly free and distinct, with 1 or 2 smaller stamens within them. Female perianth circumsciss. Carpels numerous, villous, with thick glabrous nearly sessile stigmas. Drupes closely sessile on the dilated disk or base of the perianth, ovoid, glabrous or nearly so, 3 to 4 lines long.

Queensland. Rockingham Bay, *Dallachy* (with the flowers chiefly males).

N. S. Wales. Richmond river, *C. Moore;* Hastings and Clarence rivers, *Beckler* (with female flowers and fruits).

The Queensland and N. S. Wales specimens have every appearance of belonging to one species, but require further investigation. The specimens I have seen are rather numerous, but probably each of the four gatherings from a single tree.

6. HEDYCARYA, Forst.

Flowers diœcious. Perianth hemispherical or flat, with about 8 (7 to 10) small inflexed lobes. Stamens in the males numerous, covering the whole disk or leaving a small villous centre, without rudimentary carpels; anthers sessile or nearly so, the cells usually lateral, distinct, opening longitudinally. Carpels in the females numerous, sessile, occupying the whole disk without staminodia, with one pendulous ovule in each, and terminating in a short thick obtuse style. Fruiting carpels drupaceous, small numerous crowded and almost coherent in the Australian species, larger fewer and distinct (as in *Mollinedia* and *Kibara*) in other species. Seed with a fleshy albumen. Embryo small, with erect cotyledons.—Trees or shrubs. Leaves toothed or entire. Flowers in short axillary cymes or raceme-like panicles. Bracts small or none.

Besides the Australian species which is endemic, there is one from New Zealand and another from the islands of the S. Pacific. The above-described *Mollinedia? acuminata* may possibly prove to be a second Australian species of *Hedycarya.*

1. **H. angustifolia,** *A. Cunn. in Ann. Nat. Hist. Sér.* 1, i. 215. A tall shrub or small tree, the young shoots and inflorescence slightly hoary-pubescent, the adult parts glabrous. Leaves on rather long petioles, from ovate-elliptical to oblong-lanceolate, shortly acuminate, acute or rarely rounded at the base, irregularly serrate-crenate or almost entire, mostly 3 to 4 in. long, rigidly membranous, penniveined and broadly reticulate. Flowers in short axillary raceme-like cymes, the pedicels very variable in length. Bracts usually very small or none, rarely larger and leaf-like. Perianth flatly hemispherical, 2½ to 3 lines diameter, with 8 or 10 small inflexed lobes. Stamens very numerous, covering the whole disk or concealing a very small central space. Female perianth at first smaller than the male, with smaller inflexed lobes, which become reflexed as the disk and carpels enlarge. Carpels very numerous, surrounded by a few abortive ones (or staminodia ?). Drupes 10 to 20, nearly globular and succulent, each 1 to 1½ lines diameter, all closely packed and almost connate in a globular fruit of 3 or 4 lines diameter. Endocarps crustaceous, minutely rugose.—*H. Cunninghamii*, Tul. in Arch. Mus. Par. viii. 408; *H. dentata*, var. *australasica*, Sond. in Linnæa xxviii. 228; *H. australasica*, A. DC. Prod. xvi. ii. 673; *H. pseudomorus*, F. Muell. in Trans. Phil. Inst. Vict. ii. 63, Pl. Vict. i. 23, t. suppl. 2.

N. S. Wales. Hastings river, *Fraser;* Hastings and Clarence rivers, *Beckler;* Hastings and Macleay rivers, *C. Moore;* New England, *C. Stuart;* Blue Mountains, *R. Cunningham*, *Miss Atkinson;* southward to Illawarra, *Backhouse;* Twofold Bay, *F. Mueller.*

Victoria. In moist forest gullies of the fern-tree country from Cape Otway to Mount Disappointment, and through the Western Port district and Gipps' Land to Wilson's Promontory, *F. Mueller.*

The leaves are so variable in breadth on the same specimen, that it is impossible on that ground to separate two distinct varieties.

7. PALMERIA, F. Muell.

Flowers diœcious. Male perianth hemispherical, with 4 or 5 connivent lobes. Stamens numerous, without staminodia or rudimentary carpels; anthers sessile or nearly so; the cells distinct, opening longitudinally. Female perianth nearly globular, with a minute orifice, staminodia none. Carpels numerous, with 1 pendulous ovule in each; styles filiform slightly protruding through the orifice of the perianth. Fruiting perianth enlarged, irregularly globular or pear-shaped, completely enclosing the drupes. Seed pendulous, but not seen ripe.—Woody climbers (or trees ?). Leaves entire. Flowers small, in axillary raceme-like cymes or panicles. Bracts none.

The genus is endemic in Australia.

Stamens about 20, surrounding a small hairy disk . . . . 1. *P. scandens.*
Stamens about 60, occupying the whole disk . . . . 2. *P. racemosa.*

1. **P. scandens,** *F. Muell. Fragm.* iv. 152, v. 2. A tall woody climber, the branches minutely tomentose or woolly pubescent. Leaves

shortly petiolate, ovate or broadly elliptical, acuminate, 3 to 5 in. long, hoary-tomentose on both sides or at length glabrous above. Male inflorescences somewhat branched and half as long as the leaves, female shorter and more simple. Male perianth about 2 lines diameter, flat on the top, the lobes connivent and produced into long points inflexed over the stamens into the centre of the disk before the flower expands. Stamens in the flowers examined 16 to 20, surrounding in several rows a small hairy disk; anthers oblong, slightly hairy, not longer than the perianth. Female perianth about 1½ lines diameter, densely villous inside. Carpels 10 or more, glabrous, tapering into the style. Fruiting perianth irregularly shaped, more or less fleshy, about ½ in. diameter. Drupes glabrous, with a thin exocarp and hard bony endocarp. Seed with a membranous testa, pendulous from near the apex of the cavity, with a rather long hilum, the inside dried up and the embryo undeveloped in all the drupes opened.—A. DC. Prod. xvi. ii. 657.

Queensland. Rockingham Bay, *Dallachy.*

2. ? **P. racemosa,** *A. DC. Prod.* xvi. ii. 657. A tree (*Tulasne*) with the foliage inflorescence and indumentum of *P. scandens*, or the leaves rather more contracted at the base. Male flowers also the same, except that the stamens are 60 or more, and occupy the whole disk of the flower. Female flowers and fruits unknown.—*Hedycarya racemosa*, Tul. in Ann. Sc. Nat. Sér. 4, iii. 45, and in Archiv. Mus. Par. viii. 409, t. 34.

Queensland? or **N. S. Wales?** "New Holland," *Baume, Huegel;* probably from Moreton Bay, or from the northern districts of N. S. Wales. I have not seen the specimens, but if the description is correct, notwithstanding the general resemblance to *P. scandens* shown by the figure, it must be a distinct species if a real congener.

Specimens of a tall climber from Paramatta and the Blue Mountains, *Woolls* (in Herb. F. Muell.), in leaf only, may belong to *P. scandens* or to some allied species. Other similar specimens from M'Leod's Creek, *C. Stuart*, said to be from a shrub of 12 to 15 ft., have some female flowers in very young bud, which in that state resemble those of *P. scandens*, but are not sufficiently advanced for accurate identification.

8. PIPTOCALYX, Oliv.

Flowers polygamous. Perianth-tube or disk very short, segments about 6, nearly equal, in 2 rows, very deciduous. Stamens indefinite, filaments filiform; anthers oblong-linear, adnate, the cells distinct and parallel, opening longitudinally; no rudimentary carpels in the male flowers. Hermaphrodite flowers with stamens as in the males and a single carpel, with a single pendulous anatropous ovule and a sessile broad stigma. Fruit unknown.—Woody climber. Leaves opposite, entire. Flowers in simple racemes, the males opposite with the terminal flower hermaphrodite.

The genus consists of the single Australian species. The habit is that of *Palmeria*, but the flowers are very different, and the fruit being unknown the affinity is doubtful. I am unable, however, to trace any closer connection with any other Order than that which it evidently bears to *Monimiaceæ*.

1. **P. Moorei,** *Oliv. in Herb. Kew.* A woody climber of 30 to 40 ft. (*C. Moore*), the branches inflorescence and principal veins on the

underside of the leaves ferruginous with rather long soft hairs. Leaves petiolate, ovate-lanceolate, with a long narrow point, entire or obscurely crenate, rounded at the base, 3 to 4 in. long, rather thin, shining above, pale opaque and minutely glandular-dotted underneath, the veins conspicuous on both sides. Racemes shorter than the leaves, the pedicels very short. Bracts small and very deciduous. Perianth-segments very deciduous, the outer ones ovate-orbicular, 1½ lines long, hirsute outside, the inner ones elliptical or obovate-oblong, thin, all more or less dotted with immersed glands. Stamens about 15, about 1 line long, the filaments rather shorter than the anthers; anthers tipped by a short appendage to the connective. Ovary glabrous, oblong, about 1 line long.

N. S. Wales. Hastings river, *C. Moore.*

ORDER CIII. LAURINEÆ.

Perianth regular, the tube very short or none at the time of flowering, sometimes enlarged over or under the fruit, or rarely adnate to the ovary and fruit; segments 6 or rarely fewer, all equal or 3 outer ones smaller, imbricate in the bud. Stamens normally twice as many as perianth-segments, 6 opposite them with introrse anthers, 6 within and opposite to the outer ones with the anthers extrorse in some genera, introrse in others, but in many genera 3 or sometimes all of the inner stamens, and in others 3 or all of the outer ones reduced to short staminodia or wanting, and in some flowers the stamens abnormally and irregularly increased or diminished in number; there are also frequently a pair of sessile or stipitate rather large glands, one on each side of the filament either of the inner or rarely of the outer of the two stamens opposed to the inner perianth-segments; anthers adnate, with 2 collateral cells or 2 superposed pairs of cells, each cell opening in a valve from the base upwards or in *Hernandia* from the inner to the outer side. Ovary free, or in *Hernandia* adnate, consisting of a single carpel with one ovule suspended from the apex of the cavity from a funicle adnate to its side, or rarely with a second small abortive ovule. Style simple, often very short, with a capitate disk-shaped or obliquely dilated stigma, entire or shortly and irregularly lobed. Fruit a berry or drupe, rarely dry or nearly so, the perianth entirely deciduous, or the tube enlarged and disk-shaped or cup-shaped under the fruit or more or less succulent and closing over it or adnate to it. Seed pendulous, with a membranous or (in *Hernandia*) a hard testa, without albumen. Embryo with thick fleshy cotyledons filling the seed, enclosing the plumula and short superior radicle.—Trees or shrubs with alternate or rarely irregularly opposite leaves, more or less glandular-dotted and aromatic (except in *Hernandia*) usually entire and evergreen, or, in *Cassytha*, leafless parasitical twiners. Stipules none. Flowers usually small, in cymes reduced sometimes to clusters umbels or heads, the cymes solitary or arranged in racemes, clusters, or panicles; or, in *Cassytha*, the flowers singly arranged in spikes or racemes.

A considerable Order, abundant in tropical Asia and America, less so in Africa, with a very few species penetrating into more temperate regions both in the northern and southern hemisphere. Of the eight Australian genera seven are Asiatic, three of them exclusively so (besides the Australian species), the four others with a few American representatives and two of them also African; the sixth genus has besides only two New Zealand species, but it is nearly allied to an Asiatic genus, and as far as known, still closer to a small West Indian one. The large, more especially the American genera, are none of them represented in Australia.

SUBORDER I. **Laureæ.**—*Trees or shrubs with perfect leaves. Anther valves opening upwards.*

Three stamens, belonging to the inner series, with extrorse anthers.
Anthers 2-celled.
Stamens of the outer series (usually 6) perfect.
Ovary more or less immersed in the perianth-tube, which completely encloses the fruit . . . . 1. CRYPTOCARYA.
Ovary not immersed. Perianth completely deciduous . . 2. NESODAPHNE.
Stamens of the outer series reduced to a thick prominent ring or entirely deficient. Perianth deciduous or scarcely enlarged under the fruit . . . . 3. ENDIANDRA.
Anthers 4-celled. Stamens of the outer series (usually 6) perfect.
Perianth scarcely enlarged under the fruit . . . . 4. CINNAMOMUM.
All the stamens with introrse anthers. Flowers diœcious, in heads or umbels, with an involucre of about 4 bracts.
Perfect stamens 9 or more. Perianth usually 6-merous . . . 5. TETRANTHERA.
Perfect stamens 6 or fewer. Perianth usually 4-merous . . . 6. LITSÆA.

SUBORDER II. **Cassytheæ.**—*Leafless parasitical twiners. Anther-valves opening upwards.*

Single genus . . . . 7. CASSYTHA.

SUBORDER III. **Hernandieæ.**—*Trees with perfect leaves. Anther-valves opening laterally.*

Single genus . . . . 8. HERNANDIA.

SUBORDER 1. LAUREÆ.—Trees or shrubs with perfect leaves. Flowers in cymes umbels or clusters, which are clustered or arranged in racemes or panicles, rarely solitary. Anther-valves opening upwards. Seeds with distinct thick and fleshy cotyledons.

1. CRYPTOCARYA, R. Br.

(Caryodaphne, *Blume.*)

Flowers hermaphrodite. Perianth-segments 6, equal or nearly so. Stamens of the outer series 6, all perfect with introrse anthers, of the inner series 3 with extrorse anthers, alternating with 3 short staminodia; glands 6 at the base of the inner perfect stamens or almost as near to the outer ones opposed to them. Anthers all 2-celled. Ovary immersed in the perianth-tube which after flowering closes over the ovary, and finally becomes more or less fleshy or succulent, completely enclosing and usually consolidated with the fruit, the limb of the perianth deciduous leaving a small scar at the apex or rarely persistent.—Trees or tall shrubs. Flowers small, in cymes arranged in axillary racemes or panicles, the upper ones often forming an apparently terminal panicle

with the subtending leaves very small or deficient. Fruiting perianths globular ovoid or oblong, having the appearance of inferior fruits.

The genus is chiefly Asiatic, with a few species from S. Africa and S. America. The Australian species appear to be all endemic.

Nees and Meissner distinguish *Caryodaphne* from *Cryptocarya* by the triplinerved leaves and the adherence of the fruiting perianth tube to the pericarp, but I can find no difference in the latter respect between the fruits of the typical *C. glaucescens* and those of *C. triplinervis*, and the triplinerved venation, though well marked in two species and in some leaves of *C. triplinervis*, passes gradually into the penniveined arrangement in other leaves of the latter species, and in no case draws any natural line of demarcation between the two.

F. Mueller, Fragm. v. 170, observes that the generic name of *Cryptocarya* must give way to the older name of *Peumus* established by Molina in his Natural History of Chili; but if he had turned to that work, he would have at once seen why the so-called genera there proposed are in most cases inadmissible. Molina gives no generic characters, and in the present instance, under the name of *Peumus* he includes three or four species belonging to at least three genera and two natural orders.

Inflorescence pubescent or villous.
- Leaves penniveined, with the reticulations very conspicuous underneath, scarcely so above.
  - Panicles very villous, compact. Leaves 6 to 10 in. long. Fruit nearly globular . . . . 1. *C. Murrayi.*
  - Panicles tomentose-pubescent, loose and many-flowered. Leaves 4 to 8 in. long. Fruit ovoid . . . . 2. *C. Mackinnoniana.*
  - Panicles tomentose-pubescent, loose, few-flowered. Leaves 2 to 5 in. long, softly pubescent underneath till old, the reticulations less raised than in the two preceding species. Fruit oblong . . . . 3. *C. patentinervis.*
- Leaves penniveined, the reticulations faint or equally prominent on both sides. Fruit globular.
  - Leaves thickly coriaceous, smooth and shining above, the primary veins very prominent underneath, the reticulations inconspicuous . . . . 4. *C. obovata.*
  - Leaves more or less coriaceous, the reticulations fine, conspicuous or obsolete on both sides . . . . 5. *C. glaucescens.*
- Leaves more or less triplinerved or quintuplinerved.
  - Leaves usually pubescent underneath, triplinerved, passing into penniveined. Fruit ovoid . . . . 6. *C. triplinervis.*
  - Leaves glaucous or white underneath, prominently triplinerved. Fruit globular . . . . 7. *C. cinnamomifolia.*

Inflorescence glabrous. Panicles small and loose.
- Leaves penniveined, the veins scarcely prominent . . . . 8. *C. Meissneri.*
- Leaves prominently triplinerved . . . . 9. *C. australis.*

1. **C. Murrayi,** *F. Muell. Fragm.* v. 170. A large tree, the young branches stout and softly tomentose-villous, more or less ferruginous. Leaves shortly petiolate, oblong oval or elliptical, obtuse or shortly acuminate, 6 to 10 in. long, glabrous above when full grown or the midrib minutely pubescent, very prominently penniveined and reticulate underneath, the veins rusty-pubescent, somewhat glaucous between them. Panicles short compact and villous. Flowers sessile in the cymes. Perianth hirsute, the segments rather longer than the tube (about 1 line), almost acute. Glands scarcely connected with the inner stamens, stipitate; staminodia thick, sessile, rather acute. Fruiting perianth ovoid or nearly globular, shining, about ½ in. diameter.

Queensland. Rockingham Bay, *Dallachy.*

2. **C. Mackinnoniana,** *F. Muell. Fragm.* v. 169. A noble tree 100 ft. high (*Dallachy*) or a tall shrub of 12 ft. (*W. Hill.*), the young branches petioles and inflorescence minutely rusty-pubescent. Leaves oblong or almost ovate, obtuse or shortly acuminate, rounded or cuneate at the base, 4 to 8 in. long, rather thick, at first minutely pubescent, at length glabrous and almost shining above, very prominently penniveined and reticulate underneath, the veins rusty-pubescent, often glaucous between them. Panicles loosely corymbose or thyrsoid. Pedicels very short. Perianth scarcely above 1 line long, the segments about as long as the tube. Glands large, free from the inner stamens, nearly sessile. Fruiting perianth ovoid or oblong, about $\frac{3}{4}$ in. long.

Queensland. Cape York, *W. Hill;* Rockingham Bay, *Dallachy.*

3. **C. patentinervis,** *F. Muell. in DC. Prod.* xv. i. 508 *and Fragm.* v. 166. A small tree, the branches and inflorescence ferruginous or hoary with a close tomentum. Leaves ovate to oblong-lanceolate, acuminate, 2 to 4 in. long, glabrous above, softly or minutely pubescent and more or less glaucous underneath, the primary veins prominent, the reticulate veinlets also somewhat conspicuous. Cymes sometimes solitary in the axils, more frequently several in short terminal thyrsoid panicles, the flowers not numerous, hoary-pubescent. Perianth $1\frac{1}{2}$ lines long, the tube turbinate, rather shorter than the lobes. Glands of the inner stamens shortly stipitate. Staminodia sessile, thick, acuminate. Fruiting perianth ellipsoid-oblong, nearly $\frac{1}{2}$ in. long, the pericarp rather more distinct from it than in most species.—*C. rigida*, Meissn. in DC. Prod. xv. i. 508.

N. S. Wales. Bellinger and Tweed rivers, *C. Moore;* Hastings and Clarence rivers, *Beckler.*

4. **C. obovata,** *R. Br. Prod.* 402. A fine bushy-headed tree (*Dallachy*), the young shoots and inflorescence minutely tomentose and more or less ferruginous. Leaves oblong to obovate, very obtuse and 2 to 4 in. long in the typical form, larger broader and sometimes shortly and obtusely acuminate in some northern specimens, rather thick, the margins often recurved, glabrous with the veins scarcely conspicuous above, often glaucous or even very minutely pubescent when young underneath, with the primary pinnate veins very prominent, the reticulations scarcely conspicuous. Panicles loosely thyrsoid, numerous and many flowered, the upper ones forming a terminal panicle. Flowers rather larger than in *C. glaucescens.* Perianth-segments as long as the oblong tube. Glands stipitate, appearing to belong as much to the outer as to the inner staminal series. Staminodia sessile, acuminate. Fruiting perianth globular, about $\frac{1}{2}$ in. diameter.—Meissn. in DC. Prod. xv. i. 73, 507; *C. hypospodia*, F. Muell. Fragm. v. 170.

Queensland. Rockingham Bay, *Dallachy* (with large leaves); Brisbane river, Moreton Bay, *A. Cunningham, F. Mueller, W. Hill.*

N. S. Wales. Hunter's river, *R. Brown;* Clarence and Richmond rivers, *C. Moore, Beckler, Wilcox;* Glendon, *Leichhardt.*

5. **C. glaucescens,** *R. Br. Prod.* 402. A tree of 40 ft. and upwards, the young branches and petioles minutely pubescent when young but soon becoming glabrous, the inflorescence usually hoary-pubescent. Leaves ovate elliptical or oblong, obtuse or shortly acuminate, shortly contracted at the base, flat, not usually so rigid as in *C. obovata*, penniveined and reticulate but the veins rather fine and the reticulations little conspicuous or in some varieties conspicuous or even prominent on both sides, both surfaces green or somewhat glaucous, rarely above 4 in. long in flowering specimens, but larger on luxuriant shoots. Flowers numerous, shortly pedicellate, in thyrsoid panicles shorter or longer than the leaves, the upper ones often forming a large terminal panicle. Perianth 1 to $1\frac{1}{4}$ lines long, hoary-pubescent, the tube oblong when fully out, turbinate when young, the segments about as long as the tube or rather longer. Glands stipitate, appearing to belong as much to the outer as to the inner filaments. Staminodia acuminate. Fruiting perianth depressed-globular, $\frac{1}{2}$ to nearly $\frac{3}{4}$ in. diameter.—Meissn. in DC. Prod. xv. i. 72.

Queensland. Rockingham Bay, *Dallachy;* Rockhampton, *Thozet, Dallachy;* Brisbane river, Moreton Bay, *A. Cunningham, F. Mueller,* and others.

N. S. Wales. Hawkesbury, *R. Brown;* Hastings river, *Beckler;* New England, *C. Stuart;* Port Jackson, *Woolls;* Illawarra, *A. Cunningham* and others; Sydney woods, Paris Exhibition, 1855, *Macarthur, n.* 6 *and* 30; Northern woods, n. 4, and Southern woods, n. 115, London Exhibition, 1862, *C. Moore.*

Var. *Cunninghamii.* Scarcely distinguishable from the eastern form, except by rather larger flowers and the perianth-tube rather shorter.—*C. Cunninghamii,* Meissn. in DC. Prod. xv. i. 73.

N. Australia. Hunter's river, Brunswick Bay, N.W. coast, *A. Cunningham.*

C. hypoglauca, Meissn. l.c. from N. W. Australia, which I have not seen, but is supposed to be from A. Cunningham's collection, is probably the same species.

Var *reticulata,* Meissn. Veins of the leaves more conspicuous on both sides but fine.—*C. microneura,* Meissn. l.c.—Seaview Range, *Fraser;* Hastings river, *C. Moore;* Illawarra, *A. Cunningham;* Sydney woods, Paris Exhibition, 1855, *C. Moore, n.* 5, *Macarthur, n.* 198, 224, 234.

Var. *coriacea.* Leaves thick, rigid, and more prominently reticulate, often very glaucous underneath.—Rockingham Bay, *Dallachy.*

Var. *nitida.* Leaves coriaceous and shining with fine veins, green on both sides or scarcely glaucous.—*C. Moretoniana,* Meissn. l.c. 74.—Moreton Bay, *A. Cunningham;* Archer's Creek, *Leichhardt.*

C. Bidwillii, Meissn. l.c. 74, of which the specimens from Wide Bay, *Bidwill,* are in young fruit only, and not satisfactory, may be the same variety.

All the above varieties run much one into the other, and in view of the large number of specimens I have had before me, it seems impossible to consider any of them as species permanently distinct.

6. **C. triplinervis,** *R. Br. Prod.* 402. A tall tree. Leaves ovate-elliptical or oblong-lanceolate, acuminate, glabrous above, more or less pubescent underneath, rarely above 4 in. long, triplinerved or more or less irregularly penniveined with 2 to 5 primary veins on each side of the midrib, sometimes very prominent underneath sometimes fine, the reticulations not very conspicuous. Panicles dense short and thyrsoid in the axils, or the upper ones much branched forming a terminal panicle with numerous flowers, hoary-pubescent with appressed hairs or

more frequently hirsute with spreading hairs. Flowers nearly sessile. Perianth-tube cylindrical, about 1 line long, the segments narrow and nearly as long. Stamens nearly as long as the perianth, the glands stipitate, as near to the outer as to the inner stamens; staminodia rather narrow, acuminate. Fruiting perianth ovoid, about ½ in. long.—*Caryodaphne Browniana*, Nees, Syst. Laurin. 230; Meissn. in DC. Prod. xv. i. 78.

Queensland. E. coast, *R. Brown;* Edgecombe and Rockingham Bays, *Dallachy;* Port Denison, *Fitzalan;* Rockhampton, *Dallachy, O'Shanesy,* and others; Cape river, Crocodile and Nerkool Creeks, *Bowman;* Archer's Creek, *Leichhardt;* Brisbane river, Moreton Bay, *Leichhardt, F. Mueller, W. Hill,* and others.

N. S. Wales. Richmond and Clarence rivers, *C. Moore, Beckler.*

There are two or three marked forms of foliage, but with occasional intermediates and sometimes the leaves of the principal branches different as to venation from those of the younger branches of the same specimen. In the more typical forms the leaves are rather thick, prominently triplinerved or quintuplinerved and softly pubescent underneath, in other forms the primary veins are more numerous, and in some of the northern specimens the leaves are often almost glabrous and almost as penniveined as in *C. glaucescens.* The fruit appears to be always differently shaped from that of *C. glaucescens,* although the perianth-tube is equally consolidated with the pericarp in both species.

The specimen of Milne's from Lord Howe's island, referred by Meissner to *Caryodaphne densiflora,* Blume, is in old leaf only and cannot be determined with any certainty. It appears to me to be much more like some varieties of *Cryptocarya triplinervis* than any specimen of the Javanese *C. densiflora.*

7. **C. cinnamomifolia,** *Benth.* A tree of 40 ft. (*Dallachy*), the young shoots and inflorescence minutely ferruginous-tomentose. Leaves ovate or broadly elliptical, acuminate, cuneate at the base, rigidly coriaceous, prominently triplinerved, glabrous above, glaucous or white underneath, with the reticulations conspicuous, 3 to 6 in. long. Panicles axillary or in terminal panicles, short and dense in the specimens seen but as yet only in young bud and the form of the perianth not ascertained. Stamens of *Cryptocarya,* but as yet very young. Fruit depressed globular, above ½ in. diameter, very similar to that of *C. glaucescens.*

Queensland. Rockingham Bay, *Dallachy.*

8. **C. Meissneri,** *F. Muell. Fragm.* v. 170. A small or large tree, quite glabrous in every part. Leaves elliptical or oblong-lanceolate, obtusely acuminate, contracted into a short petiole, mostly about 2 in. and rarely above 3 in. long, rather thick, penniveined but the veins irregular and even the primary ones not very prominent. Panicles short, axillary and terminal, the flowers not numerous and quite glabrous outside. Perianth-tube narrow, at first turbinate, ovoid and contracted at the top when fully out and ¾ line long, the lobes nearly as long, minutely hairy inside. Stamens much shorter than the perianth, the glands sessile but as near to the outer as to the inner stamens. Ovary immersed in the perianth-tube. Fruit not seen.—*C. hypoglauca,* var. *attenuata,* Meissn. in DC. Prod. xv. i. 508 (F. Mueller).

N. S. Wales. Hastings, Macleay and Bellinger rivers, *C. Moore, Beckler.*

9. **C. australis,** *Benth.* A large shrub or small tree, quite glabrous in all its parts. Leaves ovate elliptical or almost oblong, acuminate, contracted into a short petiole, coriaceous or thin, pale underneath but not at all white, prominently triplinerved, 2 to 4 in. long. Panicles very loose, few-flowered, always much shorter than the leaves and quite glabrous. Pedicels rather long. Perianth-tube turbinate, nearly 1 line long, the lobes at least as long, ovate and more spreading than in other species. Stamens short, especially the 3 inner ones. Ovary immersed in the tube. Fruiting perianth obovoid, pear-shaped, nearly ¾ in. long, usually crowned by the remains of the perianth-limb.—*Laurus Bowiei*, Hook. Journ. Bot. iv. 419. t. 23; *Oreodaphne Bowiei*, Walp. Ann. i. 576; *Laurus australis* A. Cunn.; Hook. Bot. Mag. under n. 3931; *Caryodaphne australis* A. Braun; Meissn. in DC. Prod. xv. i. 77.

Queensland. Brisbane river, Moreton Bay, *A. Cunningham* and many others; Rockingham Bay, *Dallachy*.

N. S. Wales. Clarence river, *Beckler;* Richmond river, *Henderson*.

The specific name *Bowiei* was originally given to this plant under a mistake as to the origin of the seeds from which it was raised at Kew, and was therefore afterwards suppressed by Hooker himself, and Cunningham's name adopted.

2. NESODAPHNE, Hook. f.

Flowers hermaphrodite. Perianth-segments 6, equal or nearly so. Stamens of the outer series 6, all perfect with introse anthers, of the inner series 3 with extrorse anthers, alternating with 3 short staminodia; glands 6, at the base of the inner perfect stamens. Ovary not immersed, the whole perianth deciduous. Berry free, resting on the apex of the slightly thickened peduncle.—Trees or tall shrubs. Leaves alternate. Flowers small in broad cymes arranged in panicles either terminal or in the upper axils. Bracts usually oblong.

Besides the Australian species which is endemic, there are two from New Zealand. The genus is moreover closely allied to the East Indian *Beilschmiedias*, scarcely differing except in the absence of the peculiar substance intruded between the cotyledons in the latter genus, which has been called a false dissepiment in the fruit, but appears rather to be an intrusion of the testa. The West Indian *Hufelandia* is perhaps still closer to or even inseparable from *Nesodaphne*.

1. **N. obtusifolia,** *Benth.* A large and handsome tree, the young shoots and inflorescence sprinkled with minute appressed hairs, otherwise glabrous. Leaves elliptical oblong or oval-oblong, obtuse or obtusely acuminate, narrowed at the base into a short petiole, rather rigid, green on both sides, penniveined and loosely reticulate, 2 to 4 in. long. Cymes large and rather broad, the upper ones in a broad pyramidal or almost corymbose terminal panicle. Pedicels thick and ½ line long above the small bracteoles. Perianth-tube very short and broad, the segments 1 line long. Stamens opposed to the outer segments broad, those opposed to the inner ones narrow; glands stipitate or almost sessile, attached to the inner stamens; staminodia sessile,

thick, acute. Berry elliptical-oblong, the whole perianth deciduous. —*Cryptocarya obtusifolia;* F. Muell.; Meissn. in DC. Prod. xv. i. 508.

Queensland. Rockingham Bay, *Dallachy;* Fitzroy river, *Bowman;* Rockhampton, *Thozet;* Archer's Creek, *Leichhardt.*

N. S. Wales. Clarence river, *Wilcox.*

3. ENDIANDRA, R. Br.

(Dictyodaphne, *Blume.*)

Flowers hermaphrodite. Perianth-segments 6, equal or nearly so. Stamens of the outer series reduced to a thick prominent ring below the perianth-segments or entirely wanting, of the inner series 3, with extrose or semi-extrose anthers, alternating sometimes with 3 small staminodia which are often deficient; glands either 6 at the base of the perfect stamens but free from them or none. Ovary not immersed. Berry free, resting on the wholly or partially persistent but not at all or scarcely enlarged perianth.—Trees. Leaves alternate. Flowers in axillary panicles, sometimes almost reduced to single cymes. Fruits oblong or globular.

The genus extends over the Indian Archipelago to the eastern provinces of India. The Australian species appear to be all endemic. The genus has been incorrectly placed in the tribe of Cryptocaryeæ as characterised by Nees and by Meissner, for neither the ovary nor the fruit are enclosed in the perianth-tube.

Perianth-tube small and turbinate, the limb broad and very open or when closed much broader than the tube.
Outer stamens replaced by a thick fleshy ring round the base of the perianth-segments.
Panicles thyrsoid. Flowers 2 to 2½ lines diameter. Bracts very deciduous. Leaves glabrous . . . . 1. *E. glauca.*
Panicles narrow, raceme-like. Flowers 3 to 4 lines diameter. Bracts persistent. Leaves rusty-pubescent or villous underneath . . . . 2. *E. hypotephra.*
Outer stamens entirely deficient. Small staminodia usually present between the inner ones.
Leaves white underneath, the primary veins prominent . . 3. *E. discolor.*
Leaves green and reticulate on both sides . . . . 4. *E. Sieberi.*
Perianth-tube thick and fleshy, broader than the connivent segments. Leaves green on both sides. Flowers small.
Leaves glabrous. Staminal glands present.
Leaves mostly oblong, much reticulate. Perianth not 1 line diameter . . . . 5. *E. virens.*
Leaves mostly elliptical-ovate, less reticulate, the primary veins more prominent. Perianth 1½ lines diameter . . . 6. *E. Muelleri.*
Leaves pubescent or villous underneath. No staminal glands . 7. *E. pubens.*

1. **E. glauca,** *R. Br. Prod.* 402. A small tree, the young shoots and inflorescence minutely ferruginous-tomentose. Leaves elliptical-oblong, acuminate, contracted at the base, mostly 3 to 5 in. long, glabrous and green above, glaucous or white underneath, otherwise glabrous or the very prominent primary veins minutely ferruginous-tomentose. Panicles thyrsoid, rather loose, shorter than the leaves, the bracts small

and very deciduous. Pedicels short. Perianth-tube turbinate, much narrower than the limb, which spreads to 2 or 2½ lines diameter. Staminodia of the outer row forming a thick fleshy crenulate ring bordering the orifice of the tube and enclosing the ovary, the 3 inner stamens protruding shortly from the ring.—Meissn. in DC. Prod. xv. i. 509.

Queensland. Endeavour river, *Banks and Solander;* Cape Grafton, *A. Cunningham;* Rockingham Bay, *Dallachy.*

2. **E. hypotephra,** *F. Muell. Fragm.* v. 166, *partly.* A moderate sized tree, the young branches petioles and inflorescence softly ferruginous-tomentose or villous. Leaves ovate ovate-elliptical or oval-oblong, shortly acuminate or rarely obtuse, 3 to 5 in. long, coriaceous, glabrous above with impressed veins, glaucous underneath, with the primary raised veins ferruginous-tomentose or villous. Flowers much larger than in any other species, few together in dense cymes on very short peduncles forming interrupted raceme-like panicles, usually shorter but sometimes as long as the leaves. Bracts small, but larger and more persistent than in the other species. Pedicels very short. Perianth-tube small, turbinate, the limb spreading to 3 or 4 lines diameter. Staminodia of the outer row forming a thick fleshy crenulate ring bordering the orifice of the tube and enclosing the ovary, the 3 inner stamens shortly protruding from the ring. Fruit oblong, ¾ in. long, resting on the persistent but not enlarged perianth.

Queensland. Rockingham Bay, *Dallachy.* F. Mueller includes both *E. glauca* and the present species under the name of *E. hypotephra*, but his description applies more especially to the present one.

3. **E. discolor,** *Benth.* A shrub or tall tree, the young branches and inflorescence minutely hoary-tomentose. Leaves ovate or elliptical, obtuse or shortly acuminate, 2 to 3 in. long, green and glabrous above, glaucous or white underneath, with few prominent primary veins, the smaller reticulations conspicuous on both sides in the full-grown leaf. Panicles thyrsoid, much shorter than the leaves, the pedicels very short. Perianth-tube small and turbinate, the limb very open, about 1¼ lines diameter, with ovate segments. Stamens of the outer row entirely deficient, of the inner series 3, with sessile glands at their base and alternating with 3 small staminodia. Fruit ovoid-oblong, ¾ to 1 in. long, resting on the unenlarged remains of the perianth.

Queensland. Albany island and Cape York, *W. Hill;* Rockingham Bay, *Dallachy.*

N. S. Wales. Macleay, Richmond and Hastings rivers, *C. Moore.*

4. **E. Sieberi,** *Nees. Syst. Laurin.* 194. A shrub or tree, glabrous except a minute pubescence scarcely perceptible on the inflorescence. Leaves ovate-lanceolate or oblong, obtuse or obtusely acuminate, 2 to 3 in. long, contracted into a short petiole, rather thin, green on both sides, with the smaller reticulations as prominent as the rather numerous and fine primary veins. Panicles thyrsoid, shorter than the leaves.

Perianth-tube very small, the limb very open. Stamens of the outer series entirely deficient, 3 of the inner series perfect with a gland on each side at the base, the intervening staminodia very small or obsolete. Young fruit globular, resting on the apex of the peduncle, the whole perianth deciduous. Ripe fruit not seen.—*Meissn. in DC. Prod.* xv. i. 79.

N. S. Wales. Port Jackson to the Blue Mountains, *Sieber, n.* 275, and many others; Sandy soil near the seacoast, *Leichhardt;* Richmond river, *C. Moore.*

5. **E. virens,** *F. Muell.; Meissn. in DC. Prod.* xv. i. 509. A tall shrub or a tree attaining a considerable height, glabrous in all its parts. Leaves oblong, usually narrow, rarely broader and elliptical, obtuse, contracted at the base, 2 to 3 in. long in some specimens, twice that size in others, not thick, green and reticulate on both sides, somewhat shining above, a few of the primary veins more prominent than the others. Panicles slender, glabrous, much shorter than the leaves. Pedicels rather long. Flowers small. Perianth-tube very thick, broadly turbinate, nearly 1 line diameter, forming a thick projecting ring round the base of the lobes which are shorter than the tube, broad and connivent, the 3 inner ones rather smaller than and quite enclosed in the outer ones. Stamens of the outer row entirely deficient, of the inner row 3, without glands at their base, but alternating with sessile staminodia. Fruit globular, ½ to ¾ in. diameter, resting on thickened pedicels of ½ in. or more.

N. S. Wales. Clarence and Richmond rivers, *Beckler, C. Moore.*

In some specimens the perianth-tube enlarges, apparently from the effect of some insect, into a hard globular verrucose gall of 1 in. diameter or more.

6. **E. Muelleri,** *Meissn. in DC. Prod.* xv. i. 509. A moderate-sized tree, glabrous except a minute ferruginous tomentum on the inflorescence and sometimes on the young shoots. Leaves ovate elliptical or broadly oblong, acuminate, cuneate at the base, green on both sides, the primary veins more prominent and the reticulations less so than in *E. Sieberi,* mostly 3 to 5 in. long. Panicles axillary, loose, much shorter than the leaves. Pedicels longer than the flower. Perianth-tube thick and fleshy, broadly turbinate, 1½ lines diameter, the lobes small and connivent. Stamens 3 with broad flattened glands; staminodia of the outer series deficient, of the inner series small or obsolete. Fruit not seen.

N. S. Wales. Hastings and Macleay rivers, *Beckler.* A specimen from Bellinger river, *C. Moore,* may belong to it also, but is only in bud and doubtful. The species is near *E. virens,* but with broader, less reticulate leaves, and the flowers twice as large. The glands in the flower of this and some other species described sometimes as staminodia appear to me to be precisely the same as the glands of the inner stamens of so many other Laurineæ.

7. **E. pubens,** *Meissn. in DC. Prod.* xv. i. 509. A large tree, the branches and petioles more or less velvety-tomentose and ferruginous. Leaves oval to elliptical-oblong, obtusely acuminate or almost obtuse, narrowed at the base, 4 to 8 in. long, glabrous above, prominently

veined and pubescent or villous underneath. Panicles axillary, broadly thyrsoid, usually about 1 in. long, sometimes more branched and half as long as the leaves, sometimes very short, more or less ferruginous-hirsute. Bracts narrow, the lower ones often 1 line long, those in the cymes smaller. Pedicels scarcely so long as the flower. Perianth nearly 1½ lines long, the tube thick, turbinate, broader than the limb, the lobes small and erect. Stamens 3, usually exserted, the filaments rather narrow, without glands, but alternating with small staminodia, the outer series quite deficient. Fruit globular, ½ to ¾ in. diameter.—*Cryptocarya Muelleri,* Meissn. l.c. 73.

Queensland. Brisbane river, Moreton Bay, *F. Mueller.*

N. S. Wales. Clarence river, *Beckler;* Richmond river, *Henderson;* Bellinger river, *C. Moore.*

Var. *glabriflora.* Perianth rather larger, glabrous. Bracts ovate, concave.—Richmond river, *Henderson.*

4. CINNAMOMUM, Burm.

Flowers usually more or less unisexual. Perianth-segments 6, equal or nearly so. Stamens of the outer series 6, all perfect with introrse anthers, of the inner series 3 perfect, with extrorse anthers, alternating with 3 short staminodia; anthers 4-celled, or the inner ones rarely 2-celled; glands 6, at the base of the inner perfect stamens. Ovary not immersed. Berry seated on the somewhat enlarged truncate or 6-lobed perianth-tube, the segments wholly or partially deciduous.—Trees or shrubs. Leaves opposite or often more or less alternate on the same tree, 3-nerved or rarely 5-nerved. Flowers in axillary panicles, more or less unisexual, the females usually rather larger and fewer in the panicle with the stamens slightly imperfect, the males smaller and more numerous with a sterile ovary. The numbers of parts of the perianth and of the stamens liable to occasional variation, especially in the females.

The genus extends over tropical and subtropical Asia as far as Japan, the only Australian species being the same as an E. Indian one.

1. **C. Tamala,** *Th. Nees.; Nees. Syst. Laurin.* 56. A large tree with a smooth almost white bark (*Dallachy*). Leaves opposite or here and there alternate, oblong-lanceolate or ovate-lanceolate, obtusely acuminate, acute at the base, 3 to 6 in. long, triplinerved, silvery underneath when young with small closely appressed hairs, the older ones glabrous or nearly so and showing underneath the fine reticulate veinlets. Peduncles in the uppermost axils, bearing in the Australian specimens (probably from a fertile tree) a loose panicle rather shorter or rather longer than the leaves more or less silvery-pubescent. Pedicels about as long as the perianth. Perianth-tube about 1 line, the segments or lobes 2 lines long. Stamens shorter than the perianth, some or all apparently perfect but unequally so in the flowers examined. Stigma broadly peltate.—Miq. Rev. Cinnam. in Ann. Mus. Lugd. Bat. i. 268; Meissn. in DC. Prod. xv. i. 17; *Laurus Tamala,* Hamilt. in Trans. Linn.

Soc. xiii. 555; *L. Cassia*, Roxb. Fl. Ind. ii. 297, not of Willd; *Cinnamomum Laubatii*, F. Muell. Fragm. v. 165.

Queensland. Sea-view Range, Rockingham Bay, *Dallachy.*

These specimens appear to me to agree perfectly with E. Indian ones of the fertile tree, accurately described by Roxburgh, who gives it as a native of various mountains of the Indian Continent. The figure of Th. Nees, in the Supplement to his Officinal Plants, represents the male or semimale form, with smaller, more numerous flowers in larger panicles. The Australian specimens have only very few of the flowers fully out, and no fruit. In Indian ones the fruiting perianth has 6 short truncate lobes, the upper portion of the lobes being alone deciduous. There are several other Indian *Cinnamoma* described as species which, as observed by both Miquel and Meissner, are very difficult to distinguish in all their various forms from *C. Tamala*, and may be hereafter united with it; but even then, as far as I have been able to ascertain, Hamilton's specific name of *Tamala* will have to be retained as the oldest.

5. TETRANTHERA, Jacq.

(Cylicodaphne, *Nees.*)

Flowers diœcious. Perianth-segments 6, equal or nearly so, or rarely unequal or fewer by abortion. Stamens of the outer series usually 6, perfect, of the inner series either 6 perfect, or 3 perfect alternating with 3 staminodia or (in species not Australian) the whole number more or less increased; anthers all introrse, 4-celled; glands usually 6, one on each side of 3 inner stamens; the stamens reduced to staminodia in the female flowers, but the glands usually present. Ovary imperfect or wholly abortive in the males, free in the females; stigma usually dilated and toothed or lobed. Berry resting on the more or less enlarged flat concave or cup-shaped perianth-tube, the segments deciduous.—Trees. Leaves alternate or rarely irregularly opposite, penniveined. Flowers in cymes reduced to small umbels heads or clusters within an involucre of 4 concave deciduous bracts, arranged in short racemes or clusters in the axils or at the leafless nodes.

A large genus, chiefly tropical Asiatic, extending in few species to Japan and Western America. Of the four Australian species, one has a wide range over tropical Asia, the others, as far as I have been able to ascertain, are endemic.

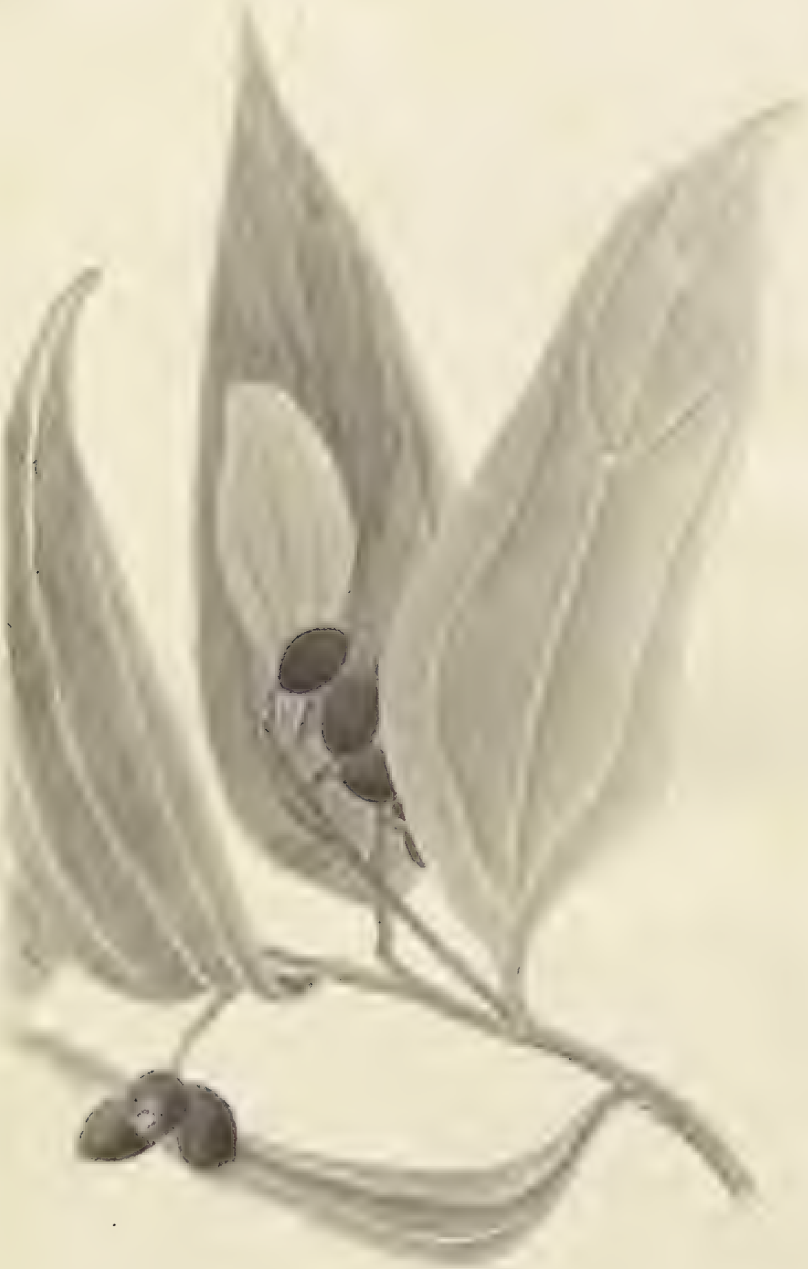
SECT. 1. **Tomex.**—*Perianth-tube slightly enlarged under the fruit, flat or slightly concave.*

Leaves hoary-pubescent or glabrous, usually large, the reticulations not prominent. Flowers rather large . . . . 1. *T. laurifolia.*

SECT. 2. **Cylicodaphne.**—*Perianth-tube more enlarged under the fruit, more concave or cupshaped.*

Leaves large, broad, very obtuse, glabrous, not reticulate . . . 2. *T. Bindoniana.*
Leaves broad or narrow, obtuse, ferruginous underneath, not reticulate . . . . 3. *T. ferruginea.*
Leaves rather thin, glabrous, conspicuously reticulate on both sides . . . . 4. *T. reticulata.*

SECT. 1. TOMEX.—Perianth-tube slightly enlarged under the fruit, flat or slightly concave.



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1. **T. laurifolia,** *Jacq., Meissn. in DC. Prod.* xv. i. 178. A small tree, the branches foliage and inflorescence more or less hoary-pubescent or the older leaves glabrous. Leaves petiolate, ovate obovate-elliptical or oblong, obtuse, shortly acuminate or rather acute, 4 to 8 in. long on the flowering branches, often larger on barren ones, green on both sides or glaucous underneath, the primary veins prominent on the underside. Peduncles 3 to 6 lines long, clustered or racemose, the common rhachis sometimes very short and usually shorter than the peduncles. Bracts of the involucres about 2 lines diameter, enclosing 5 or more sessile or very shortly pedicellate villous flowers. Perianth-segments very irregular, 1 to 6 or entirely abortive, and always very deciduous. Stamens in the Australian specimens usually 10 or 11, in some Asiatic ones more numerous; filaments filiform, hairy, 3 or 4 of the inner ones with a pair of glands at the base. Fruit globular, 3 or 4 lines diameter, resting on the more or less thickened pedicel with the persistent perianth-tube somewhat enlarged but flat or slightly concave.—*T. apetala,* Roxb. Pl. Corom. ii. 26, t. 147; R. Br. Prod. 403.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown, Henne;* Port Darwin, *Schulz.*

Queensland. Port Denison, *Fitzalan, Dallachy;* Elliott river, *Bowman.*

The Australian specimens belong chiefly to Meissner's var. *citrifolia*, with acuminate or almost acute leaves, but Brown's include also some with very obtuse leaves.

SECT. 2. CYLICODAPHNE.—Perianth-tube more enlarged under the fruit than in *Tomex,* more concave or cup-shaped.

2. **T. Bindoniana,** *F. Muell. Fragm.* v. 167. A small tree, the young branches and petioles minutely ferruginous-tomentose or at length glabrous. Leaves on rather long petioles, broadly ovate obovate or orbicular, obtuse, 5 to 8 in. long, firmly coriaceous, glabrous above, glaucous or somewhat ferruginous underneath, with the primary veins much raised, the smaller transverse ones not numerous. Male flowers not seen. Female peduncles 2 to 3 lines long, in almost sessile clusters, ferruginous-pubescent as well as the bracts. Flowers 5, sessile. Perianth nearly 2 lines long, villous; segments 6, narrow, as long as the tube. Staminodia 6, outer ones without glands, 3 inner each with a pair of glands. Ovary pubescent. Style thick, villous, with a flat spreading somewhat lobed stigma. Fruit (not seen ripe) protruding from the enlarged persistent cup-shaped truncate perianth-tube.—*Cylicodaphne Bindoniana,* F. Muell. l.c.

Queensland. Summit of M'Alister hill, Rockingham Bay, *Dallachy.*

3. **T. ferruginea,** *R. Br. Prod.* 403. A tree of 30 ft. or more, the branches and petioles ferruginous-pubescent or villous. Leaves from broadly ovate to elliptical-oblong, acuminate or rarely obtuse, rounded or cuneate at the base, 3 to 5 in. long, rather firm, glabrous and shining above, ferruginous-pubescent underneath, with raised primary veins, and transverse veinlets. Peduncles clustered in the axils or at the old nodes, 3 to 6 lines long in the males, shorter in the females.

Bracts orbicular, enclosing 5 or 6 flowers on very short thick pedicels. Perianth-segments 6, lanceolate ciliate and very deciduous in the females, broader more obtuse and sometimes fewer in the males. Perfect stamens 2, twice as long as the perianth, the filaments hairy; staminodia in the females 12, short. Fruit (not seen quite ripe) ovoid, resting in the enlarged cup-shaped truncate perianth-tube which attains 3 to 4 lines diameter,—Meissn. in DC. Prod. xv. i. 192; *Cylicodaphne Leefeana*, F. Muell. Fragm. v. 169.

Queensland. Cape Grafton and Endeavour river, *Banks and Solander*, *A. Cunningham*; Rockingham Bay, *Dallachy*; between Cleveland and Rockingham Bays, *W. Hill.*

Var. *lanceolata*, Meissn. Leaves oblong or oblong-lanceolate. Male flowers as in the typical form, females unknown.—*T. nesogena*, F. Muell. Fragm. v. 169.—Family island, Rockingham Bay, *Dallachy*; Brisbane river, *C. Moore* (Sydney woods, Paris Exhibition, 1855, n. 15).

It seems very doubtful whether *Hexanthus* of Loureiro, from Cochinchina, usually referred to *T. ferruginea*, is really the same species.

4. **T. reticulata,** *Meissn. in DC. Prod.* xv. i. 192. A tree of considerable size, glabrous except the flowers, or the young shoots minutely silky-pubescent. Leaves obovate-oblong or oblong-elliptical, obtuse or scarcely acuminate, narrowed into the petiole, mostly 3 to 4 in. long, not thick, green on both sides, the primary veins not very prominent, the reticulations much more conspicuous on the upper than on the lower surface. Peduncles 3 to 5 lines long in the males, much shorter in the females, usually in short irregular racemes or clusters, on a common rhachis at first very short but sometimes lengthening to ½ in., glabrous as well as the bracts. Perianth-segments narrow, acute, silky-villous. Stamens in the males 6 outer ones rather longer than the perianth and without glands, 3 inner rather shorter, each with a pair of glands. Staminodia in the females shorter than the perianth. Ovary glabrous; stigma broad and lobed. Fruit ovoid, resting in the enlarged truncate cup-shaped perianth-tube.—*Cylicodaphne Fawcettiana* or *Tetranthera Fawcettiana*, F. Muell. Fragm. v. 168.

Queensland. Rockingham Bay, *Dallachy*; Sydney woods (probably from Brisbane river), Paris Exhibition, 1855, *Macarthur*, *n.* 24, 192.

6. LITSÆA, Juss.

Flowers diœcious. Perianth-segments usually 4, equal or nearly so. Stamens of the outer series usually 4, perfect, of the inner series 2 perfect, without staminodia; glands 4, one on each side of the 2 inner stamens; anthers all 4-celled introrse; stamens in the females reduced to staminodia. Ovary imperfect or abortive in the males, free in the females; stigma disk-shaped. Berry resting on the flat somewhat or scarcely dilated perianth-tube, the segments persistent or deciduous.—Trees. Leaves alternate, frequently crowded and almost whorled at the ends of the shoots, usually penniveined but with few primary veins and the lower pair more prominent so as often to appear triplinerved.

Flowers in sessile or nearly sessile clusters surrounded by several very deciduous imbricate bracts.

The genus extends over tropical Asia. Of the two Australian species one is a common Indian one, the other appears to be endemic.

Glabrous or the inflorescence slightly pubescent. Fruiting perianth entire (the segments deciduous) . . . . 1. *L. zeylanica.*
More or less ferruginous-villous, at least the young shoots and inflorescence. Fruiting perianth 4-toothed (the segments wholly or partially persistent) . . . . 2. *L. dealbata.*

1. **L. zeylanica,** *Nees, fr. Cinnam. Disput. in Amœn. Bot. Bonn.* i. 58, t. 5. A large tree, the branches and inflorescence quite glabrous or scarcely hoary with a very minute tomentum. Leaves ovate-elliptical or elliptical-oblong, acuminate, contracted at the base, 3 to 5 in. long, glabrous and green above, white or glaucous underneath, penniveined but with few primary veins, the lowest pair more prominent than the others. Flowers in sessile clusters in the axils or at the old nodes, on pedicels of 1 to 2 lines usually glabrous as well as the perianths. Perianth-segments ovate-oblong, obtuse. Filaments exserted, with a few hairs about the base; glands of the two inner ones stipitate. Berry globular or slightly ovoid, larger than in *L. dealbata*, resting on the persistent perianth-tube expanded into an entire or slightly angular flat disk of 2½ to 3 lines diameter, the segments entirely deciduous.—Meissn. in DC. Prod. xv. i. 226; Wight, Ic. t. 132 and 1844.

Queensland. Lizard island, *Banks and Solander* (the specimens imperfect and therefore omitted by R. Brown); Port Denison, *Fitzalan;* Rockingham Bay, *Dallachy;* between Cleveland and Rockingham Bays, *W. Hill;* Rockhampton, *Thozet.*

The species has a wide range over tropical Asia, including *L. foliosa*, Nees, Meissn. in DC. Prod. xv. i. 222, *L. consimilis*, Nees, Meissn. l.c. 223, *L. pulchella*, Meissn. l.c. 224, and probably some others of the Prodromus. The details of the flower in Nees's plate are very indifferent, and rather coarse in Wight's figures.

2. **L. dealbata,** *Nees. Syst. Laurin.* 630. A moderate-sized tree, the young shoots softly ferruginous-villous. Leaves petiolate, ovate-elliptical or almost oblong, acuminate, contracted at the base, 3 to 6 in. long, glabrous above with the primary veins slightly prominent, glaucous underneath, the primary veins more prominent and glabrous or villous, few in number and the lowest pair usually longer and thicker. Flowers in sessile clusters, axillary or at the old nodes, the pedicels thick, 1 to 2 lines long. Perianth-segments 4, lanceolate, 1 to 1½ lines long, villous outside and the margins fringed with long ferruginous hairs. Filaments filiform, longer than the perianth, bearded with a few hairs below the middle; the staminodia in the females small and irregular. Ovary slightly hairy; stigma broad and oblique. Fruit globular, 3 to 4 lines diameter, resting on the persistent perianth-tube enlarged into a small flat disk, 4-toothed with the persistent remains of the segments.—Meissn. in DC. Prod. xv. i. 224; *Tetranthera dealbata*, R. Br. Prod. 403.

Queensland. Rockingham Bay, *Dallachy.*

N. S. Wales. Hawkesbury and Hunter's river, *Beckler;* Hastings river, *Beckler;* Richmond river, *Henderson, Fawcett;* Clarence river, *C. Moore;* Illawarra, *A. Cunningham;* Sydney woods, Paris Exhibition, 1855, *M'Arthur, n.* 101.

Var. *rufa.* The rufous hairs more abundant and persistent on the branches and underside of the leaves. Brisbane river, Moreton Bay, *Fraser*, *F. Mueller*, *W. Hill*, *Leichhardt;* Blue Mountains, *Miss Atkinson.*

SUBORDER 2. CASSYTHEÆ.—Leafless parasitical twiners. Flowers in spikes or racemes. Anther-valves opening upwards.

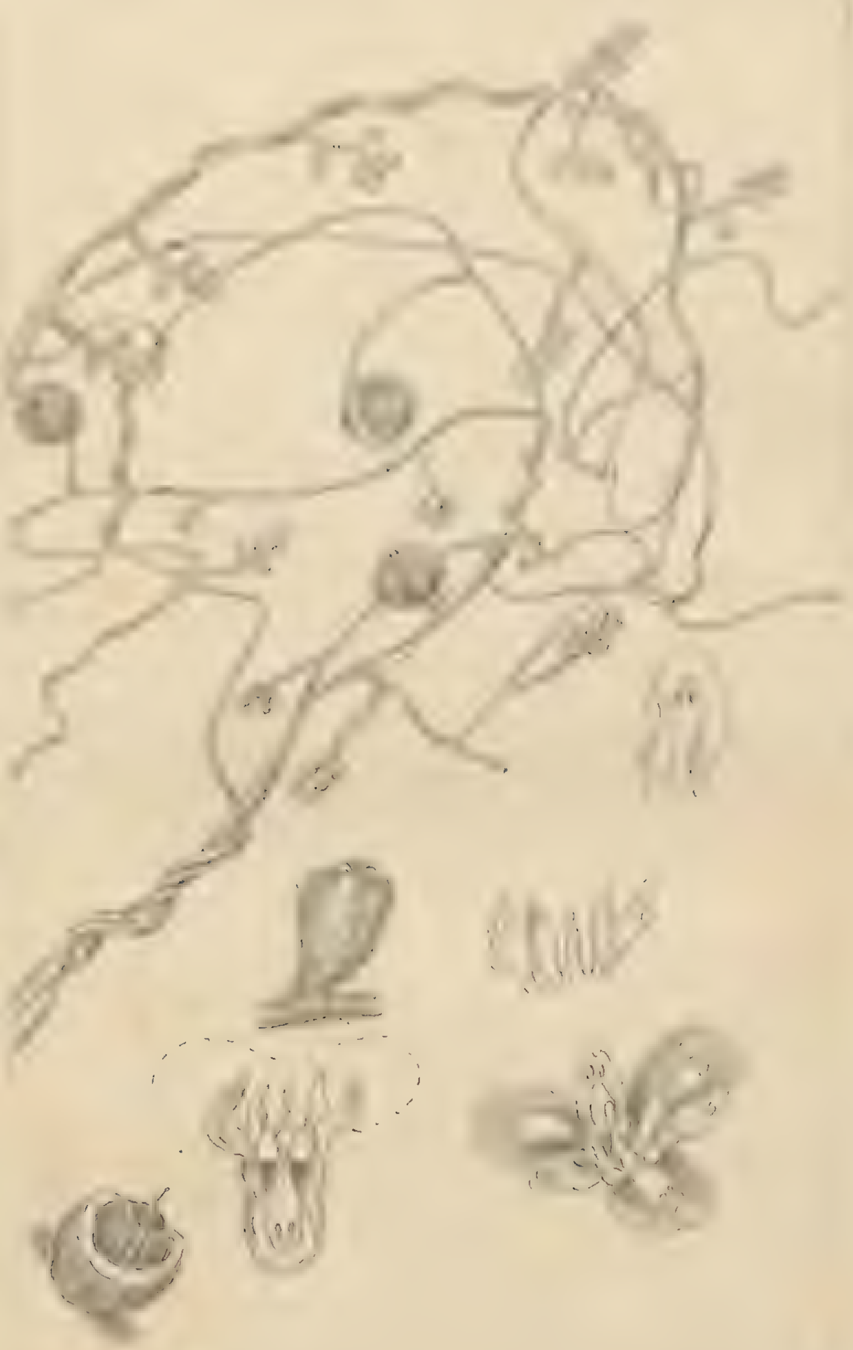
The suborder is limited to a single genus.

7. CASSYTHA, Linn.

Flowers hermaphrodite (or semi-diœcious ?). Perianth-segments 6, the 3 outer ones short broad and resembling the bracts, the three inner ones (when full grown) at least twice as long, almost valvate in the bud. Stamens of the outer row 6, all perfect with introrse anthers, or rarely 3 of them (opposite the inner segments) reduced to linear or spathulate staminodia ; of the inner series 3 perfect with extrorse anthers (opposite the outer perianth-segments), alternating with 3 staminodia ; anthers all 2-celled ; glands 6, one on each side at the base of the inner perfect stamens. Ovary free, scarcely immersed in the perianth-tube till after flowering ; stigma small, obtuse or capitate. Fruit drupaceous, completely enclosed in the enlarged persistent and succulent perianth-tube, usually crowned by the small persistent segments. Seed with a membranous testa. Embryo with thick fleshy cotyledons, distinct at an early stage, but completely consolidated when ripe, assuming the appearance of a fleshy albumen at the base of which the plumula simulates an embryo.—Leafless parasites with filiform or wiry twining stems attaching themselves to living plants (usually shrubs or trees) by means of small *haustoria* (suckers). Leaves replaced by minute scales. Flowers small, sometimes very minute, in pedunculate or rarely sessile spikes, which are either reduced to close heads or elongated and interrupted, or in racemes ; each flower sessile or pedicellate within a minute scale-like bract, with 2 similar bracteoles close under the perianth.

The genus is chiefly Australian and more or less maritime, and the species enumerated are all endemic, with the exception of one which extends also over the tropical regions of Africa, Asia, and America. There are besides one or two species from S. Africa, and one from Borneo which may be distinct, but require further investigation.

The anomalous habit of *Cassytha*, so exactly that of *Cuscuta*, has induced Lindley and others to propose it as a distinct natural Order, but the structure of the flower is so precisely that of *Cryptocarya*, that it has been again reunited with Laurineæ as a suborder. The fruit is also the same with the exception of the hard endocarp, and the cotyledons are so completely consolidated in the ripe seed, that Gærtner described them as a fleshy albumen, mistaking the plumula, which is at least as much developed as in other Laurineæ, for the embryo. R. Brown pointed out this error, and Griffith and others figured the real embryo with a distinct line of separation between the two cotyledons. In the dried fruits I had at my disposal I could not detect any such demarcation, and I should have followed Gærtner in describing the seed as albuminous had it not been for Brown's very decided contradiction, more especially as Colonel Champion in some sketches made from the living plant in Hong Kong seemed to confirm Gærtner's view. On writing, however, to Dr. Thwaites in Ceylon, he has kindly examined fresh seeds, and fully corroborates Brown's and Griffith's statements, explaining the discre-



pancies by the circumstance that it is only at an early stage that the cotyledons are clearly distinct, the line of demarcation becoming obliterated long before maturity.

In several species the specimens show two forms of flower, always on different individuals, in the one the perianth-tube is exceedingly short, in the other it is globular and as long as the segments. In both, the stamens as well as the ovary appear to be perfect, usually more advanced in the latter than in the former; but I have not as yet found any intermediate state, a circumstance which suggests a certain degree of unisexuality. Nees has generally and Meissner occasionally considered the two forms as distinct species, the one with a rotate, the other with an urceolate perianth, in which view, however, I cannot concur.

Flowers sessile in a spike or head.
Flowers capitate, very small (the spikes contracted into ovoid globose or few-flowered heads).
Spikes sessile. Flowers very few . . . . 1. *C. nodiflora.*
Spikes pedunculate. Flowers few, glabrous . . . . 2. *C. glabella.*
Spikes pedunculate. Flowers rather numerous, densely pubescent . . . . 3. *C. flava.*
(The spikes of 9, *C. micrantha*, 4, *C. pubescens*, and 8, *C. melantha*, are sometimes capitate when in bud.)
Flowers spicate, the spikes when fully out oblong or elongated, the lower or all the flowers more or less distant.
Flowers pubescent or villous. Ovary hirsute.
Spikes short, almost capitate when young. Fruiting perianth globular . . . . 4. *C. pubescens.*
Spikes elongated. Flowers all distant. Fruiting perianth obovoid or pear-shaped . . . . 5. *C. phæolasia.*
Flowers glabrous or nearly so. Ovary glabrous.
Flowers 1 to 1½ lines long. Spikes usually elongated, the flowers distant.
Fruiting perianth with 6 raised ribs . . . . 6. *C. paniculata.*
Fruiting perianth smooth, the ribs scarcely visible . . . 7. *C. filiformis.*
Flowers 2 lines long. Spikes very short . . . . 8. *C. melantha.*
Flowers ½ line long. Spikes short but slender . . . . . 9. *C. micrantha.*
Flowers (when fully out) pedicellate in a raceme, sometimes almost shortened into an umbel.
Stamens opposite the inner perianth-segments reduced to linear staminodia . . . . 10. *C. racemosa.*
Stamens all perfect . . . . 11. *C. pomiformis.*

I have been unable to recognise *C. coronata*, Nees in Pl. Preiss. i. 620, from W. Australia, Preiss, n. 1627 (Meissn. in DC. Prod. xv. i. 254), described as diœcious, densely pubescent, with short recurved peduncles, short dense spikes, the stamens of the female flowers all reduced to broad petal-like staminodia.

1. **C. nodiflora,** *Meissn. in DC. Prod.* xv. i. 252. Quite glabrous. Stems slender. Spikes closely sessile at the nodes, reduced to heads of 2 to 6 rather small sessile flowers quite glabrous. Bracts broad, obtuse, the margins often slightly fringed. Perianth nearly 1 line long. Fruit ovoid, nearly 2 lines long, but not seen perfect.

W. Australia, *Drummond, n.* 149 (in young fruit), *5th coll. n.* 226 *and* 228 (in flower).

2. **C. glabella,** *R. Br. Prod.* 404. Glabrous. Stems filiform. Spikes pedunculate, reduced to heads of 3 to 6 or rarely more very small flowers. Perianth ¾ line long, quite glabrous as well as the bracts; in some specimens the tube undeveloped but the ovaries perfect, in others the flowers rather longer and the tube enclosing the ovary but the sta-

mens apparently perfect. Fruit ovoid, about 2 lines long.—Meissn. in DC. Prod. xv. i. 254; Hook. f. Fl. Tasm. i. 318; F. Muell. Pl. Vict. ii. t. 68; *C. dispar*, Schlecht in Linnæa, xx. 578, Meissn. l.c. 253; *C. microcephala*, Meissn. l.c. 253; *C. casuarinæ*, Nees in Pl. Preiss. i. 619; Meissn. l.c. 253.

N. Australia. Islands of the gulf of Carpentaria, *R. Brown;* Sturt's Creek, *F. Mueller;* Port Darwin, *Schulz.*

N. S. Wales. Port Jackson, *R. Brown, J. D. Hooker, Clowes, Woolls;* Castlemain, *Leichhardt;* Twofold Bay, *F. Mueller.*

Victoria. Portland and Glenelg river, *Robertson;* near Melbourne, *Adamson;* Dandenong Grampian and Victoria Ranges, *F. Mueller.*

Tasmania. Port Dalrymple, *R. Brown;* abundant on the north coast, densely matted over bushes, etc., *J. D. Hooker.*

S. Australia. Kangaroo Island, *Seeley.*

W. Australia. King George's Sound and adjoining districts, *R. Brown* and many others, *Drummond* (*3rd coll.?*) *suppl. n.* 64, 68, *Preiss, n.* 1624; Murchison river, *Oldfield.*

3. **C. flava,** *Nees in Pl. Preiss.* i. 620. Stems slender, frequently filiform, more or less pubescent with whitish hairs, which are spreading or rarely appressed under the spikes. Spikes or heads globular or ovoid, consisting of very small closely sessile flowers usually more numerous than in *C. glabella* and the peduncles longer. Bracts and outer segments of the perianth ciliate and hirsute; inner segments under ¾ line long, pubescent outside with yellowish hairs. Ovary hirsute. Fruit not seen.—Meissn. in DC. Prod. xv. i. 253.

W. Australia, *Drummond,* (*3rd coll.?*) *suppl. n.* 62 *and* 67; Swan river, *Preiss, n.* 1622; near Cape Riche, *Harvey.*

4. **C. pubescens,** *R. Br. Prod.* 404. Stems more robust than in *C. glabella*, less so than in *C. melantha*, but variable, the young branches and inflorescence shortly pubescent or villous. Spikes short, forming when in bud close heads of few flowers, but lengthening out sometimes to ¾ in., with the lower flowers rather distant, the peduncle always short. Flowers usually about 1¼ lines long, pubescent outside, the inner segments appearing narrower in the fruiting specimens than in those in which the tube remains undeveloped. Ovary villous. Fruiting perianth ovoid, pubescent, about 2 lines long.—Schlecht. Linnæa, xx. 577; Meissn. in DC. Prod. xv. i. 255; Hook. f. Fl. Tasm. i. 318; *C. piligera*, Schlecht. Linnæa, xxi. 446; *C. tasmanica*, Meissn. l.c. 252; *C. rugulosa*, Meissn. l. c. 255.

Queensland. Hervey Bay and Sandy Cape, *R. Brown.*

N. S. Wales. Port Jackson, very common, *R. Brown, J. D. Hooker, Fraser, Woolls*, and others; Hastings river, *Beckler;* New England, *C. Stuart.*

Victoria. Glenelg river, *Robertson;* Port Phillip, *Gunn;* Melbourne, *Adamson;* Wilson's Promontory, *F. Mueller.*

Tasmania, *R. Brown.* Abundant in many parts of the island, *J. D. Hooker.*

S. Australia. From the Murray to St. Vincent's Gulf, *F. Mueller;* Port Lincoln, *Wilhelmi.*

W. Australia, *Drummond, n.* 147; Murchison river, *Oldfield* (the latter specimens and others from *Drummond, n.* 10, very bad and therefore doubtful).

5. **C. phæolasia,** *F. Muell. Fragm.* v. 167. Very near *C. pubescens*

and *C. filiformis*, differing from the former in inflorescence, from the latter in indumentum and from both perhaps in the form of the fruit. Stems glabrous or nearly so. Spikes pubescent, interrupted, 1 to 2 in. long, the flowers all distant. Perianth in the specimens with unenlarged tube not 1 line long, hirsute, in those with enlarging ovary, the tube at first globular densely ferruginous-hirsute, the segments shorter than the tube, pubescent or nearly glabrous. Fruit obovoid or pear-shaped, nearly 2 lines long, but not seen quite ripe.

N. S. Wales. Twofold Bay, *F. Mueller.*
Victoria. Yarra river, Portland, and near Brighton, *F. Mueller.*

6. **C. paniculata,** *R. Br. Prod.* 404. Quite glabrous or with a scarcely perceptible pubescence on the inflorescence. Spikes pedunculate, elongated and sometimes branched, the flowers usually smaller and more distant than those of *C. filiformis*, but sometimes difficult to distinguish from them. Perianth quite glabrous or rarely with a few hairs. Fruiting perianth globular, with 6 raised longitudinal ribs.—Meissn. in DC. Prod. xv. i. 256; *C. glabella*, Sieb. Pl. Exs. not of R. Br.

Queensland. Moreton island, *F. Mueller.*
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber, n.* 218, and others; Port Macquarie, *Backhouse;* Clarence river, *Beckler.*

Var. *remotiflora.* Inflorescence very slightly pubescent.—*C. remotiflora*, F. Muell.; Meissn. in DC. Prod. xv. i. 256.—To this belong the Moreton island specimens.

Specimens from New Zealand may possibly belong to this species, but they are not in fruit.

7. **C. filiformis,** *Linn.; Meissn. in DC. Prod.* xv. i. 255. Glabrous or the young shoots and inflorescence slightly pubescent. Spikes interrupted, ½ to nearly 2 in. long, the flowers all distant and sessile or nearly so. Perianth 1 to 1½ lines long, glabrous except short cilia on the margins of the outer segments, the inner ones broad, the 3 outer stamens opposite the outer segments (as in most species) much broader than those opposite the inner ones, but all perfect. Ovary glabrous. Fruiting perianth globular, 2½ to 3 lines diameter, smooth, without prominent ribs.—*C. guineensis*, Schum.; Meissn. in DC. Prod. xv. i. 255; *C. americana*, Nees; Meissn. l.c.

N. Australia? Some specimens from Victoria river, *F. Mueller*, in an imperfect state may probably belong to this species.
Queensland. Albany island, Howick's group, and between Dawson and Burnett rivers, *F. Mueller;* Rockhampton, *O'Shanesy*, *Bowman.*

The species is widely spread over tropical Asia, Africa, and America, chiefly in maritime districts, for I am unable to detect any difference between our numerous African and American specimens and the Asiatic ones. The New Zealand specimens referred by Meissner to *C. paniculata* may possibly belong also to *C. filiformis;* they are in flower only, and without the fruit the two species cannot be distinguished with certainty. Both have occasionally branched spikes, although this be more frequent in *C. paniculata* than in *C. filiformis.*

8. **C. melantha,** *R. Br. Prod.* 404. Stems glabrous, stouter and flowers larger than in any other species. Spikes very short and shortly pedunculate, sometimes almost reduced to heads especially when in bud

and few-flowered, the fruiting rhachis varying from 3 to 6 lines long, the flowers sessile. Perianth about 2 lines long, pubescent with short appressed hairs or nearly glabrous. Fruiting perianth ovoid-globular, 3 to 4 lines long, the whole plant especially the flowers usually drying very black.—Meissn. in DC. Prod. xv. i. 254; Hook. f. Fl. Tasm. i. 317; *C. robusta*, Meissn. l. c. 255.

N. S. Wales. Port Jackson, *R. Brown.*
Victoria. Near Melbourne, *Harvey;* Corner Inlet, Dandenong and Buffalo Ranges, *F. Mueller.*
Tasmania. Abundant near Launceston, chiefly on Acacias, *J. D. Hooker.*
S. Australia. Lake Victoria, Mount Baker, Flinders Ranges, *F. Mueller;* Gawler Ranges, *Sullivan* (the latter specimens bad and doubtful).
W. Australia. S.W. Bay, on Acacias near the sea, *Oldfield.*

9. **C. micrantha,** *Meissn. in DC. Prod.* xv. i. 256. As *C. melantha* is the stoutest largest-flowered species so this is the most slender and smallest-flowered one, quite glabrous, with filiform stems. Peduncles 3 to 6 lines long, with few flowers either close together at the end or the lower ones distant. Perianth scarcely ½ line long. Fruit not seen.

W. Australia. *Harvey, Drummond* (*3rd coll.?*) *suppl. n.* 61 *and n.* 152.

10. **C. racemosa,** *Nees in Pl. Preiss.* i. 621. Glabrous in the typical form, with slender stems. Spikes or racemes pedunculate with few flowers, sometimes crowded at the end of the peduncle, more frequently distant, pedicellate or rarely nearly sessile, small and glabrous. Perianth under 1 line long. Three stamens of the outer row, those opposite the inner perianth-segments, reduced to linear staminodia, nearly as long as the perfect stamens and sometimes slightly dilated above the middle, but always without anther-cells, the other stamens as in the rest of the genus. Fruiting perianth globular ovoid or obovoid, obscurely 6-ribbed, about 2 lines diameter.—Meissn. in DC. Prod. xv. i. 257; *C. Muelleri*, Meissn. l. c. 257; *C. digitata*, Nees in Pl. Preiss. i. 620; Meissn. l. c. 257.

Queensland. Moreton island, *F. Mueller.* Although from a station so distant from that of the rest of the species, and therefore distinguished under the name of *C. Muelleri*, I am unable to discover any character to separate it even as a variety.
W. Australia. King George's Sound and adjoining districts, *Harvey, Preiss, n.* 1623, *Drummond, n.* 133, 226, 229, *and suppl. n.* 68, *F. Mueller.*

Var. *pilosa.* Stems more or less pubescent, with loose spreading hairs. Racemes short, the pedicels rather long.—*C. subcapitata*, Meissn. in DC. Prod. xv. i. 253, partly. —W. Australia, *Drummond, n.* 203; King George's Sound and Gordon river, *Oldfield.*

When the pedicels are very short, *C. racemosa* might be mistaken for *C. glabella*, but it is always readily distinguished in all its forms by the staminodia instead of stamens opposite the inner perianth-segments, which I have not observed in any other species.

C. umbellata, Meissn. in DC. Prod. xv. i. 257, from towards Cape Riche, *Harvey*, seems to me to be rather a half-monstrous state of *C. racemosa*, var. *pilosa*, than a distinct species. The pedicels are most of them much elongated and thickened, sometimes 4 or 5 lines long, and irregularly clustered at the apex of a very short or of a long peduncle, but here and there in the specimens are a few racemes almost or quite normal.

11. **C. pomiformis,** *Nees in Pl. Preiss.* i. 620. Rather slender and the typical form glabrous. Spikes or racemes short and rigid, at first dense forming a small head, at length interrupted with the flowers rather distant and borne on short pedicels, the rhachis and pedicels much thickened after flowering. Perianth about 1 line long. Stamens opposite the inner segments narrow but perfect, those opposite the outer segments broad and almost petal-like. Fruiting perianth small, ovoid, not ribbed.—Meissn. in DC. Prod. xv. i. 253; *C. ceratopoda*, Meissn. l.c. 257.

W. Australia, *Drummond, n.* 151, and perhaps *n.* 150 (the latter in very young bud and doubtful); Swan river, *Preiss, n.* 1625; King George's Sound, *Harvey, F. Mueller.*

This typical form is near *C. glabella* but as the flowering advances, the longer spike and thickened pedicels will readily distinguish it.

Var. *pubiflora.* Flowers pubescent, with the short yellowish hairs of *C. flava*, but pedicellate and more or less racemose.—*C. subcapitata*, Meissn. in DC. Prod. xv. i. 253, partly; *C. multiflora*, Nees, in Pl. Preiss. i. 621; Meissn. l. c. 253.—W. Australia, *Drummond, suppl. n.* 63; King George's Sound, *Preiss*, n. 2629.

SUBORDER 3. HERNANDIEÆ.—Trees or shrubs with perfect leaves. Flowers monoecious, the females with an involucel which enlarges and encloses the fruit. Anther-valves opening laterally. Seeds without albumen.

Formerly associated with *Inocarpus*, on grounds which now appear quite unintelligible, in a distinct order, *Hernandia* has been left isolated, and I had thought, from the characters given, that it had been related to *Euphorbiaceæ.* The examination of the flowers, however, at once shows the correctness of the more recent views placing it in close connection with Laurineæ, with which Order Meissner was unwilling actually to unite it on account of the dehiscence of the anthers. The difference is, however, in this respect but very small. The shape of the stamens, their basal glands, the innate anther-cells closed by deciduous valves, are precisely the same, the only distinction being that in Laurineæ generally the valves are detached from the base upwards, and in *Hernandia* from the inner to the outer side. Another difference consists in the inferior ovary, the perianth-tube being from the first adnate, whilst in *Laurineæ* it only becomes so as the fruit enlarges (e g. in *Cryptocarya* and in *Cassytha*) or remains quite free. On the whole, therefore, it appears to me that *Hernandia* and the closely allied if not congener *Hernandiopsis* are best placed as a Suborder of Laurineæ, separated by characters of scarcely more importance than those which distinguish *Cassytha.*

8. HERNANDIA, Linn.

Flowers monoecious. Perianth-segments in two rows, valvate in each row in the bud, 3 or 4 in each row in the males and 4 or 5 in the females. Male fl. Stamens as many as the outer perianth-segments and opposite to them, with a gland on each side at the base (or in species not Australian on one side only or none); anthers 2-celled, introrse, the valves separating laterally from the inner to the outer edge. Female fl. inserted in a cup-shaped or lobed involucel. Glands or staminodia as many as outer perianth-segments and opposite to them. Ovary inferior, fleshy; style short, thick, with a dilated irregularly toothed or lobed stigma. Fruit somewhat fleshy or coriaceous, indehiscent, enclosed in the enlarged fleshy or thickly membranous involucel. Seed globular; testa thick and hard, without albumen. Embryo with thick fleshy deeply-lobed cotyledons.—Trees. Leaves alternate, peltate or palmately nerved. Flowers in loose panicles on lateral peduncles at the ends of the branches, each branch of the panicle terminating in an involucre of 4 or 5 verticillate bracts enclosing 3 flowers, the central one female, sessile within the cup-shaped involucel, the 2 lateral ones males and pedicellate.

The genus contains but few species, chiefly maritime, extending over the tropical regions of the New as well as the Old World. Of the two Australian species one has a considerable range in the Old World, the other appears to be endemic.

Leaves peltate. Involucel of the female flowers and fruits entire, truncate. Male flowers 3-merous, females 4-merous . . . . 1. *H. peltata.*
Leaves not peltate. Involucel of the female flowers and fruit deeply 2-valved. Male flowers 4-merous, females 5 merous . . . . . . 2. *H. bivalvis.*

1. **H. peltata,** *Meissn. in DC. Prod.* xv. i. 263. A large tree, with a spreading head, glabrous or the inflorescence very slightly hoary-tomentose. Leaves on long petioles, broadly ovate, acuminate, peltately attached near the base, 5- to 9-nerved and remotely penniveined, the larger ones nearly 1 ft. long, the upper ones much smaller. Panicles shorter than the leaves, the flowers almost clustered on the branches, one terminal female between two males within a whorl of 4 bracts, and sometimes one or two males lower down with a small bract under each pedicel. Male perianth slightly pubescent, the segments 3 in each row, almost petal-like, veined, about 2 lines long. Stamens 3, shorter than the segments with short filaments. Female flowers with a cup-shaped entire truncate involucel a little below the ovary and 1½ lines long at the time of flowering, but soon enlarged and growing over the ovary or perianth-tube. Perianth-tube from the first completely adnate to the fleshy ovary, segments 4 in each row, the outer ones ovate 2 lines long, the inner ones narrow. Glands 4, large and nearly globular. Style villous, thickened upwards, with a dilated oblique irregularly lobed glabrous stigma, the whole style deciduous with the perianth-lobes. Fruit completely enclosed in the involucel which has become inflated globular, smooth and fleshy, above 1½ in. diameter, with a circular entire orifice of about ½ in. diameter. Fruit about 1 in. diameter, more or less distinctly marked with 8 broad raised longitudinal ribs, with a raised terminal umbo. Seed very hard, about ¾ in. diameter. Embryo divided into 4 or 5 thick fleshy ruminate lobes.—Seem. Fl. Vit. 205, t. 32.

Queensland. Frankland islands, *M'Gillivray;* Dunk island, *Dallachy.*

The species extends over the seacoasts of the South Pacific and Eastern Archipelago, westward to the Mascarene islands and northward to the Philippine islands and Loo Choo.

2. **H. bivalvis,** *Benth.* Leaves on long petioles, ovate or ovate-lanceolate, acuminate, rounded or slightly cordate at the base but not peltate, 3- or rarely 5-nerved, 4 to 6 in. long. Inflorescence of *H.*

peltata, the involucre of 4 or 5 bracts, the central female flowers sessile, the two lateral male ones on short pedicels articulate below the middle. Involucel of 2 distinct broad concave bracts enclosing the perianth-tube or ovary. Perianth-segments usually 8 in the males, 10 in the females, about 3 lines long, in 2 rows (one of the inner rows deficient in one flower examined). Stamens 4, the filaments slender, with 2 glands. Style slender, glabrous, with a broad crenate stigma. Involucel enclosing the fruit nearly 2 in. long, very broad, cordate at the base, much inflated, of an almost membranous texture when dry and reticulate, but drying black, divided nearly to the base into 2 valves. Fruit about 10-ribbed, with a very small terminal umbo. Seed as in *H. peltata.*

Queensland. Brisbane river, *Fraser;* Wide Bay, *Bidwill;* Moreton Bay, *Herb. F. Mueller.*

ORDER CIV. PROTEACEÆ.

Flowers hermaphrodite or rarely partially unisexual. Perianth regular or irregular, deciduous, consisting of 4 segments valvately united in the bud, the claws forming a tube cylindrical or dilated towards the base, the laminæ short, forming a globular ovoid or rarely elongated limb; the segments at length separating either from the base upwards or revolute from the laminæ downwards, leaving a portion of the tube entire or open on one side, the laminæ sometimes cohering long after the segments have separated lower down. Stamens 4, opposite the perianth-segments and usually inserted on them, either with the filaments wholly adnate leaving the anthers sessile at the base of the laminæ, or the filaments shortly free below the laminæ, or very rarely the stamens entirely free from the perianth; anthers various, all perfect or rarely partially abortive, most frequently with 2 parallel cells adnate to a connectivum continuous with the filament. Hypogynous or perigynous glands or scales in many genera 4, alternating with the stamens, but in some genera variously united or reduced in number or wholly deficient. Ovary 1-celled, sessile or stipitate, more or less excentrical, with a single terminal undivided style, variously shaped at the end, with a small terminal oblique or lateral stigma. Ovules either solitary, or 2 collaterally attached or slightly superposed, or several imbricate in 2 contiguous rows, either pendulous and orthotropous, or more frequently laterally attached and more or less amphitropous, rarely erect and anatropous, the micropyle always inferior and frequently prominent from the incomplete development of the primine. Fruit either an indehiscent nut or drupe, or a more or less dehiscent coriaceous or woody follicle, very rarely a completely 2-valved capsule; either 1-celled and 1-seeded, or when 2 seeds are ripened in a drupe sometimes really 2-celled from the growth of the endocarp between as well as round the seeds, or when 2 or more seeds ripen in a follicle, apparently 2- or more-celled by the consolidation of the external coating of the 2 adjoining seeds into a membranous or woody plate detaching itself from the remainder of the seed. Seeds without albumen, the testa usually thin, rarely coriaceous or hard; embryo straight, with fleshy cotyledons and a short inferior radicle.—Shrubs or trees, rarely undershrubs or even perennial herbs. Leaves alternate or scattered, in a very few genera strictly opposite or verticillate, but often crowded under the inflorescence so as to appear verticillate, usually coriaceous, often vertical with stomata on both sides, or in the same genera horizontal or narrow and terete, entire toothed or variously divided, without stipules. Flowers axillary or terminal, solitary or in racemes or spikes, often condensed into umbels heads or cones, each flower or pair of flowers subtended by a bract, very deciduous in some genera and perhaps sometimes really deficient, the pedicels always without bracteoles.

Proteaceæ, with their chief seat in Australia and South Africa, extend on the one hand to New Caledonia, the Indian Archipelago, and tropical Asia, chiefly eastern, to Japan, and on the other to South America. The seven tribes of the Order are all in Australia. Of the first four, constituting the Nucamentaceæ, the two principal ones, Proteeæ and Personieæ, are also in South Africa, but represented by different genera, the nine Australian ones being, as well as the four constituting the small tribes Conospermeæ and Franklandieæ, all endemic with the exception of a single New Zealand species of *Persoonia*, and a New Caledonian *Cenarrhenes*. None of the Nucamentaceæ are either in America or Asia, for the South American *Andripetalum* and *Guevina*, referred by Meissner to Persoonieæ, belong with *Helicia* and *Macadamia* to the Grevilleæ. Of the Australian genera of this tribe of Grevilleeæ, *Helicia* is chiefly Asiatic, *Adenostephanus* is tropical American, with one New Caledonian species, and the large genus *Grevillea* has also a few New Caledonian species, the remaining eight genera are endemic Of the Australian Embothrieæ, *Lomatia* extends to the Andes of South America, where it is accompanied by two nearly allied genera, and *Stenocarpus* to New Caledonia; the two remaining genera, as well as the two which constitute the tribe Banksieæ, are endemic in Australia.

The clavate fusiform or disk-shaped end of the style in Proteaceæ is usually described as the stigma, and where it is more or less constricted it is said to be articulate, but I have never found any real articulation, and although the thickened style-end may be an essential aid in the collection or dissemination of the pollen, its surface is not stigmatic, the real stigma being usually very small, either on the point terminating the style-end, or in the centre of the disk, or quite lateral. The diversified mode in which in different genera the conformation of this style-end and its relation to the anthers promotes the dissemination of pollen whilst it impedes self-fertilization, upon which I have drawn up a few notes for the Linnean Society founded on the examination of dried specimens, would be an interesting study for local botanists who have the means of examining and watching the plants living in their native stations.

In the distribution of the numerous species of this most natural Order into tribes, genera, and sections, I have only had to follow, with slight modifications, the admirable arrangement proposed by Brown and further developed by Endlicher and Meissner; but in the great subdivision into Nucamentaceæ and Folliculares, these terms must not be taken strictly in their literal sense, for indehiscent drupes occur in both divisions. Taking however the fruit generally, in conjunction with the arrangement of the ovules and the inflorescence, neither of them again strictly constant, we have very fairly definite characters for two large groups which are both natural and to a certain degree geographical. For although both are abundant in Australia, the Nucamentaceæ alone are in Africa, and the Folliculares alone in Asia and America.

Suborder 1. **Nucamentaceæ.**—*Fruit an indehiscent nut or drupe. Flowers usually solitary within each bract.*

Tribe 1. **Proteeæ.**—*Anthers all perfect or very rarely the upper one abortive, with 2 parallel cells adnate to the connectivum, inserted at the base of the short spreading laminæ of the perianth. Ovule* 1 *or rarely* 2. *Stigma terminal. Fruit a dry nut.*

Flowers in dense cone-like spikes or heads with imbricate scale-like bracts, with few or many outer empty bracts forming an involucre. Anthers free.

Cone-scales firmly adhering to the rhachis and opening for the emission of the more or less flattened nuts . . . . 1. PETROPHILA.

Cone-scales either very deciduous or remaining closely imbricate after flowering till they fall off with the nuts which are not flattened . . . . 2. ISOPOGON.

Flowers solitary within an involucre of 4 to 8 bracts . . . . . 3. ADENANTHOS.

Flowers in small heads with very small bracts. Anthers cohering round the style and the adjoining cells of two different anthers applied face to face in the bud forming a single cell . . . . 4. STIRLINGIA.

TRIBE 2. **Conospermeæ.**—*Anthers: one with 2 perfect cells, two with 1 perfect and 1 abortive cell, the fourth abortive, the perfect cells broad, concave, erect, without any connective, the adjoining ones of distinct anthers applied face to face in the bud forming a single cell, all on very short thick filaments at the base of the laminæ or at the summit of the tube of the perianth. Ovule* 1. *Fruit a dry nut.*

Upper anthers abortive, replaced by a short membrane connecting the filament with the disk-shaped stigma. Nut ovoid or oblong. Leaves mostly divided . . . . 5. SYNAPHEA.

Lower anther abortive. Stigma raised above the stamens on the beak-like end of the style. Nut turbinate, flat and comose on the top. Leaves entire . . . . 6. CONOSPERMUM.

TRIBE 3. **Franklandieæ.**—*Anthers all perfect with parallel adnate cells enclosed in and adnate to the slender perianth tube. Ovule* 1. *Fruit a dry nut with a pappus-like cone.*

Single genus . . . . 7. FRANKLANDIA.

TRIBE 4. **Persoonieæ.**—*Anthers all perfect, with parallel cells adnate to the connective, the stamens inserted at or below the middle of the perianth-segments. Ovules* 2 *or sometimes* 1. *Fruit a drupe or rarely a dry nut or membranous.*

Leaves divided or lobed. Flowers in interrupted spikes or racemes. Ovules 2. Fruit dry, indehiscent.

Filaments inserted on the perianth, converging and united in a ring round the style. Fruit a nut . . . . 8. SYMPHYONEMA.

Stamens free at the base of the perianth-segments. Fruit membranous, flattened . . . . 9. BELLENDENA.

Leaves entire. Flowers in interrupted axillary spikes. Ovule 1. Fruit a 3-winged nut . . . . 10. AGASTACHYS.

Leaves toothed. Flowers in interrupted axillary spikes. Ovule 1. Fruit a drupe . . . . 11. CENARRHENES.

Leaves entire. Flowers axillary or rarely forming a terminal or infra-terminal raceme by the abortion of the floral leaves. Ovules 2 or 1. Fruit a drupe . . . . 12. PERSOONIA.

SUBORDER 2. **Folliculares.**—*Fruit dehiscent, follicular or 2-valved, rarely (in the first 2 genera), drupaceous and indehiscent. Flowers usually in pairs, with a single bract to each pair, rarely (in* Carnarvonia, Lambertia *and* Stenocarpus), *the inflorescence anomalous.*

TRIBE 5. **Grevilleeæ.**—*Ovules 2 or 4, collateral. Seeds without any intervening substances or separated by a thin lamina or mealy substance. Flowers in racemes or clusters, with deciduous or abortive bracts, or with an involucre of imbricate bracts.*

Ovules 2. Perianth regular or nearly so, small (under ½ in. except in one species), the anthers on short filaments attached below the laminæ. Style cylindrical or clavate at the end.

Flowers pedicellate, in pairs, in racemes. Fruit with a thick woody indehiscent pericarp or putamen.

Leaves alternate. Ovules ascending . . . . 13. HELICIA.

Leaves verticillate. Ovules descending . . . . 14. MACADAMIA.
Flowers sessile, in pairs, in cylindrical spikes. Fruit thick and woody, tardily dehiscent. Leaves opposite . . . . 15. XYLOMELUM.
Flowers solitary or clustered on irregularly branched peduncles. Fruit a follicle. Leaves alternate, compound . 16. CARNARVONIA.
Flowers sessile or nearly so, in pairs, in cylindrical or oblong spikes. Fruit a follicle. Leaves alternate . . . . . 17. ORITES.
Ovules 2. Perianth long and narrow. Anthers linear. Flowers solitary, or 7 together in an involucre of persistent imbricate bracts. Leaves verticillate . . . . 18. LAMBERTIA.
Ovules 2. Perianth revolute in the bud or rarely straight and regular. Anthers short and sessile within the concave laminæ. Leaves alternate.
Ovules orthotropous, pendulous. (Fruit a drupe?) . . . . 19. ADENOSTEPHANUS.
Ovules amphitropous, laterally attached. Fruit a follicle.
Seeds without wings or the wings short at both ends or annular. Inflorescence terminal, rarely also axillary . . 20. GREVILLEA.
Seeds winged, chiefly or entirely at the upper end. Inflorescence axillary . . . . 21. HAKEA.
Ovules 4, collateral. Perianth revolute in the bud or straight and regular. Anthers short and sessile within the concave laminæ. Fruit a follicle. Leaves alternate.
Perianth revolute in the bud. Hypogynous gland unilateral or semiannular. Follicle short and broad . . . . 22. BUCKINGHAMIA.
Perianth straight. Hypogynous glands 4. Follicle oblong, recurved . . . . 23. DARLINGIA.

TRIBE 6. **Embothrieæ.** *Ovules several, imbricate in 2 rows. Seeds usually separated by thin laminæ or a mealy substance.*

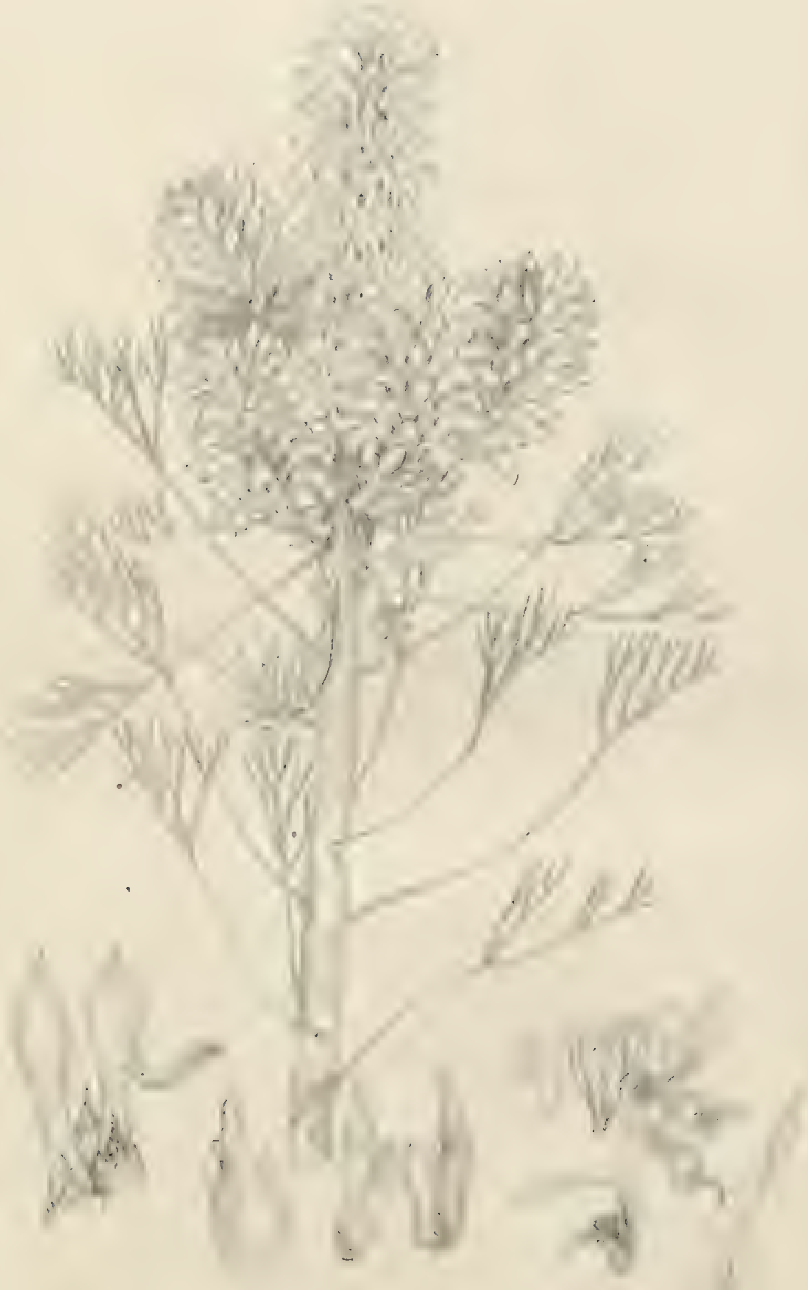
Flowers in short compact racemes, surrounded by an involucre of imbricate coloured bracts . . . . 24. TELOPEA.
Flowers in loose racemes. Bracts small or deciduous.
Hypogynous glands 3. Ovules imbricate upwards. Seeds winged at the upper end . . . . 25. LOMATIA.
Hypogynous glands 4. Ovules imbricate downwards. Seeds with narrow wings all round . . . . 26. CARDWELLIA.
Flowers in umbels without bracts . . . . 27. STENOCARPUS.

TRIBE 7. **Banksieæ.**—*Ovules 2, collateral. Seeds separated either by a hard usually woody substance or by a membrane rarely wanting. Flowers in dense cones or heads.*

Flowers in ovoid or cylindrical cones, without any involucre . . 28. BANKSIA.
Flowers in heads surrounded by an involucre of imbricate bracts and floral leaves . . . . 29. DRYANDRA.

SUBORDER 1. NUCAMENTACEÆ.—Fruit an indehiscent nut or drupe, either 1-seeded or if 2-seeded the seeds separated by a complete dissepiment continuous with the endocarp. Flowers usually solitary within each bract, in cones or spikes or solitary, very rarely racemose, the spikes often shortened into heads.

TRIBE 1. PROTEEÆ.—Anthers all perfect, or very rarely the upper one abortive, with 2 parallel cells adnate to the connectivum, inserted at the base of the short spreading laminæ of the perianth. Ovule 1 or in a very few species a second one more or less developed. Stigma at the point of the straight style end. Fruit a dry nut.



Petrophila pulchella.

1. PETROPHILA, R. Br.

Flowers hermaphrodite. Perianth regular, the tube slender, separating into 4 segments from the base or (in two sections) remaining united, the limb of 4 linear laminae. Anthers all perfect and free, sessile at the base of the laminae, usually linear, the connective produced into a small appendage. No hypogynous scales. Ovary sessile, with a single or very rarely 2 collateral ovules, pendulous from near the apex of the cavity, and orthotropous or slightly amphitropous. Style filiform, either dilated and truncate towards the end under a slender or continuous and fusiform *brush*, always glabrous below the brush, the brush usually shortly hispid or papillose, at least before the expansion of the flower, with a glabrous tip and terminal stigma. Fruit a small dry and indehiscent nut, usually compressed, sometimes winged, with a coma of long hairs on the margins or from the base only or also on one very rarely on both faces.—Shrubs with rigid entire or divided leaves, terete or if flat usually narrow. Flowers usually white or yellow, in dense spikes or *cones*, each flower sessile within a bract or scale; the cones globular ovoid oblong or rarely cylindrical, terminal or rarely axillary, the receptacle or rhachis woolly and usually cylindrical, the scales broad and hardened after flowering, persistent, at least at the base, and imbricate but not so closely so as in *Isopogon*, opening for the emission of the fruit, the thinner points of the scales often falling off after flowering. At the base of the cone are also several imbricate empty bracts forming an involucre sometimes larger than the scales and concealing them, usually smaller, persistent or deciduous. In several species new leaves and shoots form in the axils of the innermost of these empty bracts, which ultimately fall away, leaving the old cones sessile in the forks of the branches without empty outer bracts. Nuts usually shorter than the scales, the points rarely but the coma frequently protruding.

The genus is limited to extratropical Australia and is chiefly Western. Like the closely allied *Isopogon*, it differs chiefly from the South African genera of the same tribe in the absence of hypogynous scales. The part of the style which is here termed the brush, is usually considered as an upper article of the stigma, but I have never observed any real articulation separating it from the rest of the style, and it does not appear to be ever stigmatic except at the point.

Sect. 1. **Arthrostigma.**—*Leaves undivided. Cones terminal, usually large. Style thickened and truncate below the narrow villous or hirsute brush.*

Leaves terete (slightly grooved in *P. acicularis*).
Scales of the cone not striate. Leaves usually rather thick.
Style-brush very densely and closely tomentose-villous, much longer than broadly turbinate style-end below it. Outer bracts free and narrow . . . . 1. *P. teretifolia.*
Style-brush densely hirsute with spreading hairs, rather longer than the narrow-turbinate style-end below it. Outer bracts rigid, linear-lanceolate . . . . 2. *P. longifolia.*
Style-brush loosely hirsute with spreading hairs, much longer than the broadly-turbinate style-end below it. Outer bracts very numerous, linear-subulate . . . . 3. *P. media.*

Scales of the cone more or less ribbed or striate. Leaves long and slender. Style and bracts of *P. media* . . . 4. *P. acicularis.*

Leaves flattened, rigidly linear. Style and bracts of *P. media* 5. *P. linearis.*

SECT. 2. **Xerostole.**—*Leaves flat, ternately divided or rarely entire. Cones axillary, ovoid. Perianth tube slender, usually falling off entire. Style thickened and usually truncate under the narrow nearly glabrous brush.*

Nuts with broad wing-like margins, shortly comose at the base only.

Leaves undivided or 3-fid, 2 to 4 in. long. . . . . 6. *P. heterophylla.*

Leaves all divided, the segments mostly lobed or again divided.

Leaf-segments broad and short (rarely narrow-linear in the lower leaves). Cone-scales villous. Perianth 8 to 10 lines long. Style-end long and narrow below the brush 7. *P. biloba.*

Leaf-segments linear. Cone-scales villous. Perianth 4 to 5 lines long. Style-end shortly turbinate below the brush 8. *P. propinqua.*

Leaf-segments linear. Cone-scales glabrous. Perianth 4 to 5 lines long. Style-end only slightly thickened below the brush . . . . 9. *P. squamata.*

Nuts comose on the faces as well as on the margins, tapering upwards (uncertain in *P. colorata*). Style-end shortly turbinate below the brush.

Outer cone-scales larger than the empty bracts, coloured and glabrous . . . . 10. *P. colorata.*

Outer cone-scales small and villous, concealed under the large coloured and glabrous empty bracts . . . . . 11. *P. striata.*

SECT. 3. **Serrurioides.**—*Leaves divided, the segments terete or flat. Cones axillary, ovoid. Perianth-tube slender, usually falling off entire. Style continuous, fusiform.*

Leaf-segments terete, rigid, pungent, divaricate, the whole leaf usually 2 to 3 in. broad . . . . 12. *P. divaricata.*

Leaf-segments terete but grooved above, the whole leaf not exceeding 1 in.

Leaf-segments erect or divaricate, fine but often pungent . 13. *P. Serruriæ.*

Leaf-segments very close, compact and erect, not pungent . 14. *P. inconspicua.*

Leaf-segments flat, few, rather broad, the whole leaf usually 2 to 4 in. long . . . . 15. *P. trifida.*

SECT. 4. **Symphyolepis.**—*Leaves flat, lobed or divided. Cones axillary or rarely also terminal. Perianth-segments usually falling off separately. Style continuous, fusiform.*

Leaves sessile, oblong-lanceolate, pinnatifid. Perianth-limb glabrous . . . . 16. *P. carduacea.*

Leaves petiolate, divided. Perianth glabrous. Cones often long.

Nut broad, obtuse, the inner face glabrous . . . . . . 17. *P. Shuttleworthiana.*

Nut tapering at the end, comose on both faces . . . . . 18. *P. macrostachya.*

Leaves variously divided. Perianth villous . . . . 19. *P. diversifolia.*

SECT. 5. **Petrophyle.**—*Leaves divided or rarely simple, the segments terete (or flat but narrow in the first two species). Cones terminal (or in the Eastern species also axillary). Perianth segments falling off separately. Style continuous, fusiform.*

Leaves flat, divided. Cones ovoid or oblong. (See above, 17. *P. Shuttleworthiana* and 18. *P. macrostachya.*)

Leaves flat, with 3 or 5 segments, or the lower ones entire. Cones broadly globular.

Leaves glabrous; segments long and divaricate. Perianth glabrous. Nut with comose margins . . . . 20. *P. biternata.*
Leaves plumose-hirsute; segments small, on a long petiole. Perianth villous. Nut comose at the base only . . . . 21. *P. plumosa.*
Leaves or leaf-segments terete.
Leaves crowded, ¼ to ¾ in. long.
Leaves undivided. Perianth glabrous. Nuts with comose margins . . . . 22. *P. ericifolia.*
Leaves pinnate. Perianth villous. Nuts comose at the base only . . . . 23. *P. chrysantha.*
Leaves more than 1½ in. long
Eastern species. Cones usually 2 or 3 at the end of the branches, often axillary when old. Leaves not pungent.
Cones pedunculate. Perianth glabrous . . . . 24. *P. pedunculata.*
Cones sessile. Perianth silky-villous.
Foliage glabrous. Cones oblong . . . . 25. *P. pulchella.*
Young shoots silky or hoary. Cones ovoid . . . . 26. *P. sessilis.*
Western or Southern species. Cones solitary, terminal or in the forks.
Perianth glabrous. Cones ovoid or globular.
Leaf-segments numerous, fastigiate, not pungent . . 27. *P. fastigiata.*
Leaf-segments divaricate, pungent-pointed, the lower leaves sometimes entire . . . . 28. *P. seminuda.*
Perianth villous. Leaf-segments divaricate and pungent-pointed.
Outer bracts large and imbricate, concealing the cone-scales. Cone nearly flat-topped, 1½ in. diameter . 29. *P. circinata.*
Cones large, ovoid-globular, glutinous.
Perianth viscid. Fruiting cones globular . . . . 30. *P. Drummondii.*
Perianth not viscid. Fruiting cones ovoid or oblong 31. *P. crispata.*
Cones ovoid, oblong or cylindrical, not viscid.
Cones ovoid, chiefly terminal. Branches glabrous . 32. *P. rigida.*
Cones ovoid-oblong or cylindrical, chiefly in the forks.
Leaf-segments numerous and short. Branches glabrous . . . . 33. *P. multisecta.*
Leaf-segments few and long. Branches tomentose 34. *P. conifera.*

SECT. 6. **Hebegyne.**—*Leaves terete, simple or 2- or 3-lobed at the end. Cones terminal or in the forks. Perianth-segments falling off separately. Style pubescent, thickened towards the end, but scarcely fusiform.*

Single species . . . . 35. *P. semifurcata.*

P. Roei, Endl. Gen. Suppl. iv. 75, has never been described, and is most probably the same as one of the species here enumerated.

SECT. 1. ARTHROSTIGMA, Endl.—Leaves undivided. Cones terminal, usually large. Style thickened and truncate below the narrow villous or hirsute brush. Perianth-segments usually separating from the base.

1. **P. teretifolia,** *R. Br. in Trans. Linn. Soc.* x. 68, *Prod.* 364. A shrub, either erect and tall or sometimes diffuse, glabrous except the cones. Leaves terete, not grooved, somewhat thickened upwards or the lower ones slender, 1½ to 2 in. long in some specimens, 4 to 8 in. long in others. Cones terminal, sessile or very shortly pedunculate above the last leaves, nearly globular or at length almost ovoid, ½ to ¾

in. diameter without the perianths. Outer bracts not numerous, not exceeding the scales, a few of the outermost lanceolate-subulate and rigid, the others broader and passing into the cone-scales, which are broad, scarcely acuminate, glabrous except at the base or shortly ciliate, 2 lines diameter when in flower, 3 to 4 lines when in fruit. Perianth about 8 lines long, villous with hairs at first silky at length spreading, the segments usually falling off separately. Style-end glabrous, broadly turbinate and truncate below the narrow-cylindrical, very densely and closely tomentose-villous brush, the glabrous tip short. Nut broad and much flattened, the long marginal coma protruding beyond the cone-scales, the inner face hairy, the outer one glabrous.—Meissn. in Pl. Preiss. i. 492 and in DC. Prod. xiv. 268; *P. crassifolia*, R. Br. Prot. Nov. 5; Meissn. ll. cc.

W. Australia. Lucky Bay, *R. Brown*, *Baxter*; towards Cape Riche, *Preiss, n.* 630, *Drummond, 4th coll. n.* 259 *and* 260; Stirling and Russell Ranges, Cape Arid and Israelite Bay, *Maxwell.*

The differences observed in Baxter's specimens, on which *P. crassifolia* was founded, appear to me to be owing to the specimens being in a more advanced fruiting state.

2. **P. longifolia,** *R. Br. Prot. Nov.* 5. A shrub with the leaves terete and undivided as in *P. teretifolia*, but usually 6 to 10 in. long. Cones terminal and sessile within the last long leaves, broadly ovoid-conical, ¾ to 1 in. diameter without the perianths. Outer bracts rigid, linear-lanceolate, 4 to 5 lines long. Cone-scales broad, not striate, glabrous except at the base, more or less acuminate and not ciliate. Perianth rather slender, 8 or 9 lines long, hirsute, the segments falling off separately. Style-end below the brush glabrous, oblong-turbinate, nearly as long as the brush which is densely hirsute but with hairs more distinct and spreading than in *P. teretifolia.* Nut as broad as long, with comose margins, the outer face glabrous, the inner one convex and covered with long hairs.—Meissn. in Pl. Preiss. i. 493 and in DC. Prod. xiv. 269.

W. Australia. Dry stony and gravelly places, King George's Sound and adjoining districts, *Baxter*, *Drummond*, *2nd coll. n.* 241, *Preiss*, *n.* 623, 625, *F. Mueller*, and others; eastward to the Mount Barren ranges, *Maxwell.*

Var. *tenuifolia.* Leaves longer and more slender, the cones and flowers smaller, the cone-scales broader and less acuminate.—Kalgan river, *Oldfield.*

3. **P. media,** *R. Br. Prot. Nov.* 5. A shrub with the habit of *P. teretifolia.* Leaves similarly terete and rather thick, varying very much in length even on different branches of the same specimen, mostly 2 to 3 in. long but in some specimens all under 2 in., in others 4 to 10 in. long, obtuse or when long with recurved points. Cones terminal, sessile, ovoid, 6 to 7 lines diameter without the perianths when full-grown. Outer bracts linear-subulate, much more numerous and longer than in *P. teretifolia*, and often whitish in the dried state. Cone-scales ovate-lanceolate, not at all or very obscurely ribbed, with acuminate often reflexed or at length deciduous summits, not ciliate. Perianth 7 or 8 lines long, villous, the segments falling off separately. Style-end below

the brush glabrous, broadly turbinate, much shorter than the narrow brush which is hirsute, with the hairs short and spreading as in *P. longifolia*, but not nearly so dense, and the glabrous tip longer.—Meissn. in Pl. Preiss. i. 492, ii. 245 and in DC. Prod. xiv. 268; *P. brevifolia*, Lindl. Swan Riv. App. 35; Meissn. in Pl. Preiss. i. 491 and in DC. Prod. xiv. 268.

W. Australia. King George's Sound, Mount Gardner, *Baxter;* N. of Stirling Range, *F. Mueller*, and from thence to Swan river, *Drummond*, *n.* 14, 39, 2*nd coll. n.* 293, 3*rd coll. n.* 240 (*or* 241 ?); *Preiss*, *n.* 628, 629; Champion Bay and Port Gregory, *Oldfield.* In all the above specimens the leaves are mostly under 4 in. long and sometimes under 2 in.

Var. *juncifolia.* Leaves rather more slender, 6 to 10 in. long and often with a hooked or recurved point.—*P. juncifolia*, Lindl. Swan Riv. App. 35; Meissn. in Pl. Preiss. i. 493; and in DC. Prod. xiv. 269.—Swan river, *Drummond*, 1*st coll. n.* 553; *Preiss*, *n.* 621, 622, 624.

The species is readily distinguished from the two preceding ones by the outer bracts. The style-end below the brush is short as in *P. teretifolia*, but the brush itself is thinly hirsute, not densely and closely villous or *tow-like* (*stuposus*) as in that species.

4. **P. acicularis,** *R. Br. in Trans. Linn. Soc.* x. 69, *Prod.* 364. A low erect nearly simple or tufted shrub of about 2 ft., glabrous except the cones. Leaves undivided, usually slender, terete and more or less distinctly grooved on the upper side, obtuse or with a short straight or curved point, 2 to 6 in. long. Cones terminal and sessile, nearly globular, about ¾ in. diameter, the outer bracts rigidly linear, slightly broad at the base, often numerous. Cone-scales from broadly ovate to ovate-lanceolate, more or less acuminate, the summits sometimes deciduous, the hardened portion striate with several nerves especially prominent after flowering. Perianth of *P. media.* Style-end shortly turbinate below the brush, scarcely half as long as the narrow brush which is not very densely hirsute with short spreading hairs. Nut broad and flat, the margins comose with long hairs, the outer face glabrous, the inner villous.—Meissn. in Pl. Pr. i. 494 and in DC. Prod. xiv. 268; Bot. Mag. t. 3469; *P. filifolia*, R. Br. ll. cc., Meissn. ll. cc.

W. Australia. King George's Sound, common, *R. Brown*, *A. Cunningham*, *Baxter*, *Drummond. n.* 181 (*or* 184?), 3*rd coll. n.* 242, *Preiss*, *n.* 626, *Oldfield*, *F. Mueller*.

This species has the bracts and the style nearly of *P. media*, but the longitudinal ribs of the cone-scales are always more prominent and the leaves more slender.

5. **P. linearis,** *R. Br. Prot. Nov.* 6. An erect shrub of about 2 ft., glabrous except the cones or hoary-glaucous. Leaves linear, flat but thick, 1 to 2 or rarely 3 lines broad above the middle, contracted into a terete base or petiole, mostly incurved towards the end or falcate, obtuse or with a straight or curved point, 1½ to 4 in. long. Cones globular or ovoid, sessile at the ends of the branches, ½ to ¾ in. diameter without the perianths. Outer bracts as in *P. media*, linear-subulate and often numerous. Cone-scales broad, not ciliate, smooth or when old slightly striate. Perianth at least 1 in. long, very densely villous with silky-white or ferruginous hairs, the segments falling off separately. Style-

end narrow-turbinate below the brush, rather shorter than the brush, which is not very densely hirsute with short spreading hairs. Nut broad and flat, the margins comose with long hairs, the outer face glabrous, the inner villous. -Meissn. in Pl. Preiss. i. 494 and in DC. Prod. xiv. 267.

W. Australia. Swan river, *Fraser, Drummond, 1st coll. n.* 558, *Preiss, n.* 636; Vasse and Swan rivers, *Oldfield.*

Var. *anceps.* Leaves straighter with thinner margins; flowers rather smaller.—*P. anceps*, R. Br. Prot. Nov. 5; Meissn. in DC. Prod. xiv. 267.—W. Australia, *Drummond, 4th coll. n.* 261, *5th coll. n.* 394; King George's Sound, *Baxter;* foot of Stirling Range, *F. Mueller.*

SECT. 2. XEROSTOLE.—Leaves flat, ternately divided or rarely entire. Cones axillary, ovoid. Perianth-tube slender, usually falling off entire or shortly splitting into four at the base. Style thickened and usually truncate at the end under the narrow nearly glabrous brush.

The inflorescence and perianth are nearly those of the section *Serrurioides*, but the style is that of *Arthrostigma*, except that the brush is only very minutely papillose-pubescent or quite glabrous, although it appears to collect the pollen as in other sections.

6. **P. heterophylla,** *Lindl. Swan Riv. App.* 35. A rigid shrub, glabrous except the cones. Leaves linear or linear-lanceolate, more or less flattened, entire and acute or dilated towards the end and then often truncate or notched with a small point in the notch, or deeply divided into 2 or 3 lobes, the whole leaf 2 to 4 in. long, rigid and veined, much narrowed to the base. Cones all axillary, sessile, ovoid-oblong, $\frac{1}{4}$ to $\frac{1}{2}$ in. long without the perianths, the old ones often $\frac{3}{4}$ in. long. Outer bracts numerous and imbricate, the outermost small, the inner ones passing into the cone-scales of which the outer ones are broadly ovate and ciliate only, the inner ones smaller and more villous. Perianth slender, 9 to 10 lines long, hairy, the tube falling off entire. Ovary glabrous except the hairs at the base. Style-end clavate truncate and 4-angled below the narrow glabrous brush. Nut flat, dilated into wing-like margins, often notched at the top, glabrous except a coma of short hairs at the base.—Meissn. in Pl. Preiss. i. 501, ii. 246, and in DC. Prod. xiv. 274.

W. Australia. Swan river to King George's Sound, *Drummond, 1st. coll n.* 571, *3rd coll. n.* 244; Stirling Range, *F. Mueller.*

7. **P. biloba,** *R. Br. Prot. Nov.* 7. A shrub, with the branches not very stout, the young shoots tomentose-pubescent and villous with spreading hairs, the older foliage and branches glabrous. Leaves, of the flowering branches at least, usually small, very rigid and flat, petiolate, 3-lobed or pinnately 4-lobed, the rhachis terminating in a point or small lobe, the lower lobes sometimes again lobed and the lobes all very obliquely ovate rhomboid or oblong, pungent pointed, under $\frac{1}{2}$ in. long, but the lower leaves in some specimens and nearly all in others crowded and more divided into very narrow linear lobes. Cones small, ovoid, sessile in the axils, often numerous and crowded along the branches,

scarcely above ¼ in. long when in fruit. Outer bracts small and not numerous. Cone-scales silky-villous, with small glabrous tips. Perianth very villous with spreading hairs, rather slender, 8 to 10 lines long, the tube usually falling off whole. Style-end below the brush long and narrow, rather clavate than turbinate, the brush shorter, filiform, minutely papillose or glabrous. Nut flat with wing-like margins, obovate-orbicular, glabrous except a short coma at the base.—Meissn. in Pl. Preiss. i. 500, and in DC. Prod. xiv. 273.

W. Australia. Swan river, *Fraser, Drummond,* 1*st coll. n.* 566, *Preiss, n.* 656; Mount Toodyay, *Oldfield.*

8. **P. propinqua,** *R. Br. Prot. Nov.* 7. A shrub of 3 or 4 ft., glabrous except the cones, or the young shoots minutely hoary, the branches rather slender. Leaves with long petioles, twice trifid or pinnate with the lower pinnæ again divided, the segments flat, linear or linear-lanceolate, mostly pungent-pointed, about ½ in. long or rather longer when narrow. Cones small, ovoid or at length globular, sessile in the axils, not ½ in. long without the perianths. Outer bracts nearly glabrous, small, acute, rigid. Cone-scales villous or with very small glabrous tips. Perianth 4 to 5 lines long, very villous with spreading hairs, the tube falling off entire. Style-end broadly turbinate 4-angled and truncate under the narrow terete almost glabrous brush. Nut flat with broad wing-like margins, broadly obovate, 2 lines long, glabrous except a few hairs forming a short coma at the base.—Meissn. in Pl. Preiss. i. 501, and in DC. Prod. xiv. 273.

W. Australia. Swan river, *Fraser, Drummond,* 1*st coll n.* 567.

Var. *sericiflora.* A stouter shrub. Leaves more divided, rigid, pungent-pointed, the segments ½ to 1 in. long. Perianth rather smaller and more silky-villous.—East Shoal Cape and Cape Arid, *Maxwell.*

9. **P. squamata,** *R. Br. in Trans. Linn. Soc.* x. 70, *Prod.* 365. A shrub of 2 or 3 ft., glabrous except the cones, or the young branches slightly tomentose. Leaves on rather long petioles, once or twice ternately divided, with flat linear rigid pungent-pointed segments, sometimes very short and rather broad, sometimes very narrow and ¼ to ½ in. long. Cones small, ovoid, sessile in the axils, almost globular when in fruit, not above ½ in. long. Outer bracts small. Cone-scales acute, rigid but smooth and sometimes almost scarious, glabrous or slightly ciliate, pubescent at the base only. Perianth slender, silky-villous with short hairs, under ½ in. long, the tube falling off entire. Style-end somewhat thickened and glabrous under the rather long filiform nearly glabrous brush. Nut flat, broad, with wing-like margins, slightly pubescent, with a very short coma at the base.—Meissn. in DC. Prod. xiv. 272; *P. Cunninghamii,* Meissn. in Pl. Preiss. i. 499, ii. 245; *P. gracilis,* A. Cunn. Herb.

W. Australia. King George's Sound and adjoining districts, *Menzies, Fraser, Preiss, n.* 651, 652, *F. Mueller;* Vasse and Gordon rivers, *Oldfield;* Clay flats, Willyungup, *Maxwell.*

Meissner's varieties *major* and *gracilis* appear to me to be old and young plants or branches of the same plant rather than distinct varieties.

10. **P. colorata,** *Meissn. in Pl. Preiss.* ii. 246, *and in DC. Prod.* xiv. 273. A glabrous shrub with the habit and foliage of *P. squamata.* Cones also as in that species ovoid and sessile in the axils; outer bracts ovate-lanceolate, acuminate, pale-coloured, much smaller than the scales; cone-scales much longer than in *P. squamata*, coloured and glabrous or ciliate towards the base, the outer ones ovate, the inner lanceolate, the larger ones fully 3 lines long. Perianth slender, silky-villous, the tube falling off entire. Style-end rather broadly turbinate angular and truncate under the filiform brush as in *P. propinqua.* Nut not seen ripe, when young it appears to be comose on the margins and inner face.

W. Australia, *Drummond, 2nd coll. n.* 296.

11. **P. striata,** *R. Br. Prot. Nov.* 6. A rigid shrub of 1 to 2 ft., the young shoots pubescent and sprinkled with long fine hairs, otherwise glabrous except the cones. Leaves petiolate, once or twice pinnate, the segments linear or cuneate, narrow or broad, entire or lobed, divaricate rigid and pungent-pointed, the whole leaf with the petiole 1½ to 2½ in. long, and nearly as broad. Cones sessile in the upper axils, ovoid and under ½ in. long without the perianths, more globular and ½ in. diameter when in fruit. Outer bracts numerous, imbricate, glabrous, almost membranous, gradually enlarged, the inner ones 3 or 4 lines long concealing the scales. Cone-scales villous, the outer ones shortly ovate, the inner longer and lanceolate. Perianth ¾ in. long, silky-villous, the tube long and slender, falling off entire, the lobes tipped with horn-like glabrous appendages nearly 1 line long. Style-end turbinate clavate angled and truncate under the slender nearly glabrous brush. Nuts lanceolate, tapering into a long beak, comose all over near the base, often 4 or 5 lines long including the beak.—Meissn. in Pl. Preiss. i. 502, ii. 246, and in DC. Prod. xiv. 275.

W. Australia. Swan river, *Fraser, Drummond,* 1*st coll. n.* 565, *Preiss, n.* 639, 640, *Clarke.*

SECT. 3. SERRURIOIDES.—Leaves divided, the segments terete or flat. Cones axillary, ovoid. Perianth-tube slender, usually falling off entire. Style-end continuous, fusiform, usually shortly hirsute at the angles with reflexed hairs.

The plants of this section show the nearest approach to *Isopogon,* the perianth and style are nearly the same as in some species of that genus, but the cone-scales and nuts are those of *Petrophila.*

12. **P. divaricata,** *R. Br. Prot. Nov.* 7. A shrub attaining 3 to 6 ft., the branches and young leaves often bearing long fine spreading hairs, otherwise glabrous except the cones. Leaves twice pinnate, the pinnæ and segments very divaricate, terete, pungent-pointed, rigid, but not thick. Cones sessile in the upper axils or within the last leaves, ovoid or oblong, usually about ¾ in. long and ½ in. diameter without the perianths. Outer bracts deciduous, rather broad, acutely acuminate, glabrous outside, silky inside, the young shoots often protruding from within them whilst the cone is still in flower. Cone-scales broad, villous

with rather long acute silky-hairy points. Perianth rather slender, ½ to ¾ in. long, conspicuously silky-villous with short yellow hairs, the tube usually falling off entire. Style-end continuous, fusiform with reflexed hairs on eight prominent longitudinal lines. Fruiting cones with the scales closely imbricate, becoming more glabrous, but retaining short points. Nuts with wing-like margins, truncate on the top, ciliate with short hairs especially at the base, otherwise glabrous.—Meissn. in Pl. Preiss. i. 498, and in DC. Prod. xiv. 272; *P. intricata*, Lindl. Swan. Riv. App. 35.

W. Australia. Swan river, *Drummond*, 1st *coll. n.* 568; King George's Sound and adjoining districts, *Baxter, Preiss, n.* 646, *Oldfield, Maxwell, F. Mueller.*

13. **P. Serruriæ,** *R. Br. Prot. Nov.* 6. An erect shrub of 3 or 4 ft., not much branched, the young branches and leaves silky-pubescent or sprinkled with long fine spreading hairs, the older foliage more glabrous. Leaves small, crowded, twice or thrice pinnate with the lower segments close to the base, the segments numerous, slender, terete, grooved above, erect or divaricate, softly acute or pungent-pointed, the whole leaf rarely above 1 in. long and broad. Cones ovoid or at length globular, sessile or shortly pedunculate in the upper axils, often crowded in terminal clusters, scarcely above ½ in. diameter when in fruit. Outer bracts few and small, glabrous outside. Cone-scales villous at the base, with glabrous deciduous tips. Perianth slender, silky or ferruginous-villous, about 5 or 6 lines long, the tube usually falling off entire, the laminæ short, tipped with small glabrous points or stipitate glands sometimes very prominent, sometimes concealed within the hairs. Style-end continuous, fusiform, more or less hirsute with reflexed hairs in longitudinal lines. Nut rather narrow, tapering into the style, glabrous on the back, the inner face and sides comose with long hairs chiefly from the base.—Meissn. in Pl. Preiss. i. 497 and in DC. Prod. xiv. 271; *P. glanduligera*, Lindl. Swan. Riv. App. 35; Meissn. in Pl. Preiss. i. 498, and in DC. Prod. xiv. 271; *P. axillaris*, Meissn. in Hook. Kew Journ. vii. 68, and in DC. Prod. xiv. 275.

W. Australia. King George's Sound and adjoining districts, *Baxter, Fraser, F. Mueller, Oldfield, Maxwell;* and thence to Vasse and Swan rivers, *Oldfield, Drummond,* 1st *coll. n.* 569, *Preiss, n.* 641; between Moore and Murchison rivers, *Drummond,* 6*th coll. n.* 166.

Some of the northern specimens (*P. glanduligera*) have the leaves more silky-hairy and less pungent, but others are quite like the southern ones.

14. **P. inconspicua,** *Meissn. in Hook. Kew Journ.* vii. 68, *and in DC. Prod.* xiv. 272. A shrub with the aspect almost of an *Adenanthos* or of *Isopogon adenanthoides*, the young shoots tomentose-pubescent and sprinkled with long fine spreading hairs. Leaves short, crowded, pinnate with compact narrow terete segments, grooved on the upper side, minutely pointed but not pungent, the whole leaf about ½ in. long. Cones in our specimens crowded in leafy tufts at the ends of the branches, but all in an advanced state, the outer bracts apparently fallen off. Cone-scales linear or lanceolate, thin and flat, villous outside. Perianth very

slender, hirsute, nearly 1 in. long, the tube falling off entire except the lower glabrous portion which is more persistent as in *Isopogon*. Style-end continuous, fusiform, slightly thickened at the base, and hirsute with a few reflexed hairs disappearing after the flowering is over. Nut, according to Meissner, nearly flat, oval, with a short obtuse terminal wing, glabrous with ciliolate margins. I have only found young fruits which appeared to me to be comose all over, as in *Isopogon*.

W. Australia. Between Moore and Murchison rivers, *Drummond, 6th coll. n.* 172. This species has so much of the character of *Isopogon*, that I should at once have transferred it to that genus were it not for the uncertainty which prevails about the shape and indumentum of the nut, besides that the style is much more that of the section *Serrurioides* of *Petrophila* than of *Isopogon adenanthoides*, which is the nearest to the present species in *Isopogon*.

15. **P. trifida,** *R. Br. in Trans. Linn. Soc.* x. 70, *Prod.* 365. A rigid shrub, the young shoots bearing a few fine spreading hairs, otherwise glabrous except the cones. Leaves on long flattened petioles, cuneately 3-fid or deeply pinnatifid, with few usually broad rigid pungent-pointed segments, the lower ones sometimes 1 in. long when narrow, the whole leaf with the petiole 2 to 4 in. long. Cones small, ovoid or nearly globular, sessile in the axils or terminating very short axillary branches, not ½ in. long without the perianths, or, when in fruit, ½ to ¾ in. long. Outer bracts glabrous small and narrow. Cone-scales broad, glabrous in the lower part, densely villous round the obtuse end. Perianth silky-villous, about ½ in. long, the tube slender, usually falling off entire. Style-end continuous, fusiform, hirsute with a few reflexed hairs in longitudinal rows. Nut flat, ovate, 2 to 3 lines long, with broad wing-like margins, glabrous except a short coma at the base.—Meissn. in Pl. Preiss. i. 501, and in DC. Prod. xiv. 273, but not the plate quoted of Lodd. Bot. Cab.

W. Australia. Lucky Bay, *R. Brown*; towards Cape Riche? *Drummond, 1st coll. n.* 576.

SECT. 4. SYMPHYOLEPIS, Endl.—Leaves flat, lobed or divided, the segments broad or also narrow. Cones axillary or rarely also terminal. Perianth-segments usually falling off separately. Style-end continuous, fusiform.

This section has the essential characters of *Petrophile*, differing generally but not absolutely in foliage and inflorescence and in the axis of the cones and the base of the cone-scales usually more hardened when in fruit.

16. **P. carduacea,** *Meissn. in DC. Prod.* xiv. 274. A shrub with the young branches tomentose-pubescent or villous with spreading hairs, the adult foliage glabrous. Leaves sessile, oblong-lanceolate, pinnatifid or deeply toothed and undulate, the lobes or teeth broadly triangular, pungent-pointed, the lowest pair of lobes rather smaller, more deeply separated and occasionally toothed, having the appearance of stipules. Cones axillary, pedunculate, at first small and globular, ovoid or ovoid-oblong when in fruit, above 1 in. long and ¾ in. diameter. Bracts small along the peduncles and a few close under the cone, all as

well as the cone-scales glabrous. Perianth scarcely above 4 lines long, the tube silky-villous and readily separating into segments, the limb broader and glabrous. Ovary hairy. Style-end continuous, fusiform, with a few reflexed hairs. Scales of the fruiting cone very broad. Nut very flat, with wing-like margins, 3 lines long and broad, pubescent with short hairs, with a short coma at the base.

W. Australia. *Drummond, 4th coll. n.* 262; Stirling Range, *F. Mueller.*

17. **P. Shuttleworthiana,** *Meissn. in Pl. Preiss.* ii. 246, *and in DC. Prod.* xiv. 275. A rigid shrub, glabrous except the cones. Leaves on long petioles, flattened upwards, cuneate and deeply 3-fid, the segments broad or narrow, often above 1 in. long, entire or 2-3-fid, the lobes all very rigid and pungent-pointed. Cones sessile or shortly pedunculate, terminal or in the upper axils, oblong or cylindrical, ¾ to 1 in. long, ¼ in. diameter without the perianths, or when in fruit and perfect twice as long and thick, but often partially abortive and remaining short. Outer bracts very deciduous. Cone-scales at first small, densely villous outside, glabrous inside with small lanceolate glabrous deciduous tips, very broad and glabrous in the old cones. Perianth glabrous, 4 or 5 lines long, the segments falling off separately. Style-end continuous, fusiform, shortly and sparingly hirsute. Nut broad, not winged but the margins acute, the margins and outer face comose, the inner glabrous.

W. Australia. *Drummond, 2nd coll. n.* 298; Murchison river, *Oldfield.*

18. **P. macrostachya,** *R. Br. Prot. Nov.* 7. A shrub of 2 or 3 ft., the young branches tomentose or villous, the adult foliage glabrous. Leaves on rather long petioles, once twice or three times deeply trifid, the lobes or segments broad or narrow, veined, rigid, pungent-pointed, the whole leaf 1½ to 3 in. long. Cones sessile in the axils and sometimes also terminal, cylindrical, about 1 in. long when in flower, 1½ to 2 in. long, and nearly ½ in. diameter when in fruit. Outer bracts not numerous, glabrous, shorter than the scales. Cone-scales villous at the base, with glabrous acuminate deciduous ends. Perianth glabrous, about ½ in. long, the segments falling off separately, each tipped with a small point. Style-end continuous, fusiform, shortly and sparingly hirsute. Nut broad or narrow, not winged, acuminate, hairy all over but the marginal coma longer than the hairs of the faces.—Meissn. in Pl. Preiss. i. 502, and in DC. Prod. xiv. 275.

W. Australia. Swan river, *Fraser, Drummond, 1st coll. n.* 575; *Preiss. n.* 638; W. coast, *Baudin's Expedition.*

19. **P. diversifolia,** *R. Br. in Trans. Linn. Soc.* x. 70, *Prod.* 365. A shrub attaining 6 or 8 ft., the young branches often pubescent or villous, the adult foliage glabrous and sometimes shining and veined like the fronds of some ferns. Leaves petiolate, pinnate, the pinnæ sometimes few broadly cuneate toothed or pinnatifid, giving the whole leaf a broadly triangular form of 1 to 2 in., sometimes numerous and lanceolate, the lower ones pinnatifid the upper ones gradually smaller and more entire, the whole leaf ovate-lanceolate in form and 2 or 3 in. long,

the segments and teeth mucronate-acute and sometimes pungent-pointed, but less so than in *P. striata* and *P. macrostachya*. Cones axillary, pedunculate, ovoid, ½ in. long when in flower, 1 in. when in fruit. Outer bracts glabrous. Cone-scales villous, with small glabrous often deciduous tips, and the whole scale becoming nearly glabrous when in fruit. Perianth densely villous, about ½ in. long, the segments falling off separately, tipped with prominent slender glabrous points. Style-end continuous, fusiform, nearly glabrous. Nut flat, broader than long, expanded at the top into 3 wing-like lobes, the lateral ones diverging, the central one bearing the style, glabrous except a short coma at the base.—Meissn. in Pl. Preiss. i. 499, ii. 246, and in DC. Prod. xiv. 274.

W. Australia. King George's Sound and adjoining districts, *R. Brown*, *A. Cunningham*, *Preiss*, *n.* 637, *F. Mueller*, and others; Vasse river, *Oldfield;* Darling Range, *Drummond, 2nd coll. n.* 297, (*3rd coll.?*) *n.* 267.

SECT. 5. PETROPHILE, Endl.—Leaves divided or rarely simple, the segments terete or, in *P. biternata* and *P. plumosa*, flat but narrow. Cones terminal, or in *P. pedunculata* and *P. pulchella*, also axillary. Perianth-segments falling off separately. Style-end continuous, fusiform.

20. **P. biternata,** *Meissn. in Hook. Kew Journ.* vii. 69, *and in DC. Prod.* xiv. 275. A stout rigid shrub, glabrous except the cones or the branches minutely hoary-tomentose. Leaves pinnate with 3 or 5 segments or the lower ones again 2- or 3-lobed, all flat but narrow, thick and rigid, pungent-pointed, ½ to 1½ in. long. Cones ovoid-globular, above 1 in. diameter, terminal and almost sessile above the last leaves. Outer bracts broad, short, hard, glabrous and shining. Cone-scales broad, the outer ones 3 or 4 lines long, acuminate, rigid, woolly at the base only, the inner ones smaller, very woolly, with small glabrous tips. Perianth scarcely above ½ in. long, slender, glabrous or slightly viscid. Style-end continuous, fusiform, shortly papillose-hirsute. Nut broadly obovate, the margins comose, both faces glabrous.

W. Australia. Between Moore and Murchison rivers, *Drummond*, *6th coll. n.* 168.

21. **P. plumosa,** *Meissn. in Hook. Kew Journ.* vii. 69, *and in DC. Prod.* xiv. 273. An erect shrub of 1 or 2 ft., the branches virgate, hoary-tomentose and hirsute as well as the leaves with long fine spreading hairs, the older foliage becoming nearly glabrous. Leaves linear-spathulate, dilated at the end and entire or shortly divided into 2 or 3 rigid pungent-pointed flat lobes, the whole leaf ¾ to 1½ in. long. Cones terminal, sessile, depressed-globular, ¾ in. diameter without the perianths. Outer cone-scales ovate-oblong, villous at the base, the deciduous upper portion glabrous with ciliate margins, the inner ones narrow and villous. Perianth apparently nearly 1 in. long but not seen very perfect, very villous with long fulvous hairs, the segments falling off separately. Style end continuous, narrow fusiform, nearly

glabrous. Nuts flat, with broad wing-like margins, obovate, truncate, 3 lines long, minutely pubescent and very shortly comose at the base.

W. Australia. Moore river, *Drummond, 6th coll. n.* 164.

22. **P. ericifolia,** *R. Br. Prot. Nov.* 5. An erect shrub of 2 or 3 ft., with virgate branches more or less tomentose or woolly, but usually almost concealed under the foliage which is usually glandular or scabrous-pubescent, with a few longer glandular hairs, or sometimes almost or quite glabrous and smooth. Leaves terete, not thick, ¼ to ½ in. long, erect and crowded along the branches, mostly terminated by a small point or oblique gland or quite obtuse. Cones terminal, sessile, at first broadly ovoid, at length globular, ½ to ¾ in. diameter. Outer bracts ovate-lanceolate, glutinous, imbricate and persistent. Cone-scales with the upper portion lanceolate acute very glutinous and imbricate on the young cones, but deciduous, leaving the enlarged base broadly ovate tomentose and villous in the fruiting cone. Perianth slender, 7 or 8 lines long, glutinous and hirsute with spreading hairs, the segments often separating but not so readily as in some species. Style-end continuous, narrow-fusiform, almost glabrous. Nut rather broad, the margins comose, both faces glabrous.—Meissn. in Pl. Preiss. i. 494, and in DC. Prod. xiv. 267.

W. Australia. King George's Sound and adjoining districts, *R. Brown, Baxter, Drummond, Preiss, n.* 650, and many others.

Var. *scabriuscula.* Leaves rather longer and more scabrous, cones larger; flowers more villous.—*P. scabriuscula,* Meissn. in Pl. Preiss. i. 495, and in DC. Prod. xiv. 268.—Swan river? *Drummond, 1st coll. n.* 557.

Var. *glabriflora.* Perianth glabrous.—Stirling Range, *F. Mueller.*

P. phylicoides, R. Br. Prot. Nov. 6; Meissn. in DC. Prod. xiv. 268, described from some specimens of Baxter's from Lucky Bay, without perianths, appears to me to be the same as the more glabrous forms of *P. ericifolia,* a species which as a whole is very distinct from any other. The small crowded leaves give it some outward resemblance to *P. inconspicua* or to *P. chrysantha,* but these leaves are all simple, never divided as in the latter two.

23. **P. chrysantha,** *Meissn. in Hook. Kew Journ.* vii. 68, *and in DC. Prod.* xiv. 271. A shrub of 2 or 3 ft., with erect branches, the young shoots tomentose-pubescent and sprinkled with long fine hairs, becoming at length nearly glabrous. Leaves short and crowded along the branches, simply pinnate, with terete pungent-pointed segments grooved above, the lowest pair proceeding from near the base of the petiole, the whole leaf not exceeding ¾ in. Cones terminal, sessile, ovoid, 3 to 4 lines diameter without the perianths. Outer bracts broad, obtuse or with minute points, imbricate, glabrous except the ciliate margins; outer cone-scales similar, the inner ones gradually narrower, more concave, hirsute outside with long hairs, glabrous inside. Perianths about 5 lines long, very densely hirsute with yellow or fulvous hairs, the segments falling off separately. Style-end continuous, fusiform, at first bearing a few reflexed hairs, but at length nearly glabrous. Nuts expanded in the upper part into 2 flat truncate wings, 2 lines long and

1½ lines broad, densely comose at the base, the remainder hirsute with shorter hairs.

W. Australia. Between Moore and Murchison rivers, *Drummond, 6th coll. n.* 165; near Dandaroga, *Oldfield.*

24. **P. pedunculata,** *R. Br. in Trans. Linn. Soc.* x. 70, *Prod.* 364. A tall glabrous shrub. Leaves pinnate with much divided 2- 3-chotomous pinnæ, the ultimate segments numerous, rather fine, rigid but not pungent, terete and grooved above. Cones axillary, ovoid or oblong, ¾ to 1 in. long, on peduncles of ¼ to ½ in. with small empty bracts at the base of the peduncle. Cone-scales glabrous, broad, hard, with a short persistent erect point. Perianth glabrous, about 5 lines long, the segments falling off separately. Style-end continuous, fusiform, angular, minutely pubescent or glabrous. Nut broad, the margins comose, both faces glabrous.—Meissn. in DC. Prod. xiv. 269; Guillem. Ic. Pl. Austral. t. 18.

N. S. Wales. Blue Mountains, *R. Brown, Sieber, n.* 20, *A. and R. Cunningham* and others.

25. **P. pulchella,** *R. Br. in Trans. Linn. Soc.* x. 69, *Prod.* 364. A shrub of 6 to 8 ft., glabrous as well as the foliage or minutely pubescent when young. Leaves twice or thrice pinnate, the segments numerous, not spreading, terete, grooved above, rather slender and not pungent, the whole leaf 1½ to 2½ in. long, the petiole as long as the divided part. Cones terminal, sessile, solitary or with one or two axillary ones close below it, oblong or cylindrical, 1 to 1½ in. long, and ½ to ¾ in. diameter without the perianths. Outer bracts few and small. Cone-scales broad, the outer ones very shortly acuminate and pubescent, the inner more silky at the base with lanceolate deciduous points, all at length broad hard and glabrous. Perianth silky-pubescent, 6 to 7 lines long, the segments falling off separately. Style-end continuous, narrow-fusiform, sparingly and shortly hirsute. Nut broad, copiously comose on the margins, more sparingly hirsute on the inner face, glabrous on the back.—Meissn. in DC. Prod. xiv. 270; *Protea pulchella*, Schrad. Sert. Hannov. 15, t. 7; Cav. Ic. t. 550; Bot. Mag. t. 796; *Protea fucifolia*, Salisb. Prod. 48; *Petrophila fucifolia*, Knight. Prot. 92; *Protea dichotoma.* Cav. Ic. vi. 34, t. 551.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Sieber, n* 19, *Fl. Mixt. n.* 479, and many others.

26. **P. sessilis,** *Sieb. in Roem. and Schult. Syst. Veg.* iii. *Mant.* 262. A shrub attaining 8 to 12 ft., closely allied to *P. pulchella*, and as suggested by R. Brown, perhaps a variety with a more rigid foliage, the segments divaricate and the young shoots hoary-tomentose or almost silky. Cones rather broader and shorter. Perianths and style and nuts the same.—R. Br. Prot. Nov. 6; Meissn. in DC. Prod. xiv. 270; *P. canescens*, A. Cunn. in R. Br. Prot. Nov. 6; Meissn. l.c. 270.

Queensland. Moreton Bay, *A. Cunningham, Fraser.*
N. S. Wales. Blue Mountains, *Caley, Sieber, n.* 21; New England, *C. Stuart, C. Moore;* Sydney woods, Paris Exhibition, 1855, *Macarthur, n.* 214.

27. **P. fastigiata,** *R. Br. in Trans. Linn. Soc.* x. 70, *Prod.* 364. A shrub of about 3 ft., glabrous except the cones or the branches slightly tomentose. Leaves twice or thrice ternately divided, the petiole as long as the divided portion, the segments terete, slender but obtuse or nearly so, all erect and attaining about the same height. Cones terminal, ovoid, sessile, $\frac{3}{4}$ to 1 in. long when in fruit. Outer bracts numerous, imbricate, silky inside, broadly triangular and acute, at length deciduous. Cone-scales woolly at the base, broad, with small deciduous glabrous tips. Perianth glabrous, about 5 lines long, the segments falling off separately. Style-end continuous, fusiform, very shortly hirsute. Nuts narrow, acute, comose on the margins and more sparingly so on the back, glabrous on the front or inner face.—Meissn. in DC. Prod. xiv. 270; F. Muell. Fragm. vi. 245.

W. Australia. Lucky Bay, *R. Brown*, *Baxter;* near Eyre's Range, *Maxwell.*

28. **P. seminuda,** *Lindl. Swan Riv. App.* 34. A bushy shrub of 2 or 3 ft., quite glabrous except the cones. Leaves once or twice 3-fid, with terete segments of $\frac{1}{2}$ to 1 in., not very thick but rigid and pungent-pointed. Cones terminal, sessile, ovoid, attaining $\frac{1}{2}$ in. diameter. Outer bracts numerous, ovate-lanceolate or lanceolate, acute, at length deciduous. Cone-scales with a broad woolly-tomentose base, and small deciduous lanceolate glabrous tips. Perianth glabrous, about $\frac{1}{2}$ in. long, not very slender, the segments falling off separately. Style-end continuous, fusiform, very shortly and sparingly hirsute. Nut ovate, with comose margins, the back hairy, the inner face glabrous. Meissn. in Pl. Preiss. i. 495 and in DC. Prod. xiv. 269.

W. Australia. Swan river, *Drummond, 1st coll. n.* 561, 562, 572, *Preiss, n.* 634, 635; Stirling Range, *F. Mueller;* Cape Le Grand, *Maxwell.*

Var *indivisa.* Leaves 1 to 2 in. long, mostly undivided or here and there a few bifid or trifid at the end.—W. Australia, *Drummond.*

29. **P. circinata,** *Kipp.; Meissn. in Hook. Kew Journ.* vii. 67, *and in DC. Prod.* xiv. 272. A stout bushy shrub, glabrous except the cones or the branches slightly pubescent. Leaves crowded, twice pinnate, with numerous divaricate intricate terete and pungent-pointed segments, the whole leaf 3 to 5 in. long. Cones terminal, large, depressed-globular. Outer bracts numerous, broad, shortly acuminate, coriaceous, glabrous or minutely hoary outside, silky-villous inside, mostly above $\frac{1}{2}$ in. long, imbricate, forming an involucre of 1 to $1\frac{1}{2}$ in. diameter, concealing the scales. Cone-scales lanceolate or linear, apparently deciduous. Perianths exceedingly numerous, villous with minute glabrous tips, projecting about $\frac{1}{4}$ in. beyond the outer bracts, forming an almost flat top of $1\frac{1}{2}$ in. diameter, the segments readily separating. Style-end continuous, narrow-fusiform, very sparingly hirsute or nearly glabrous. Nut ovate, acute, shortly comose on the back as well as the margins.

S. Australia? N. of Adelaide, *Whittaker* (*Herb. Hook.*), but possibly some mistake.

W. Australia, *Drummond, 5th coll. Suppl. n.* 3.

The cone-scales appear to be deciduous and the involucre large and persistent as in *Isopogon latifolius*, and others of the section *Hypsanthus* of that genus; the perianth, style and nut (the latter not seen perfect) are rather those of *Petrophila*.

30. **P. Drummondii,** *Meissn. in Pl. Preiss.* i. 496, *and in DC. Prod.* xiv. 270. An erect shrub, glabrous except the cones or the upper branches and leaves softly pubescent. Leaves twice or thrice ternately divided, or pinnate with the lower pinnæ twice or thrice divided, the segments terete and pungent-pointed, $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Cones terminal, sessile, ovoid or nearly globular, $\frac{3}{4}$ to 1 in. diameter. Outer bracts rather numerous, ovate-lanceolate, glutinous but otherwise glabrous. Cone-scales with a broad woolly-villous base and ovate-lanceolate or lanceolate deciduous ends, the outer scales in the old cones becoming glabrous. Perianth (about $\frac{3}{4}$ in. long?) hirsute with spreading viscid hairs, the segments falling off separately. Style-end continuous, rather long, fusiform, hirsute. Nut broad, not acuminate and at length notched at the end, comose on the margin and outer face, the inner face glabrous.

W. Australia, *Drummond, 1st coll. n.* 570.

P. triternata, Kipp.; Meissn. in Hook. Kew Journ. vii 67, and in DC. Prod. xiv. 270, from Drummond's 2nd coll. n. 2, appears to me to be the same plant with cones in a more advanced state, with the leaves of young shoots growing out from within the outer bracts. In neither are the perianths in a very good state.

31. **P. crispata,** *R. Br. Prot. Nov.* 6. A rigid shrub, very closely allied to *P. Drummondii* and to *P. rigida*, and perhaps a variety of the latter. Leaves twice or thrice divided, with terete pungent-pointed segments, shorter and more rigid than in *P. Drummondii*, longer than in *P. rigida*. Cones terminal, sessile, ovoid or at length oblong and sometimes above 1 in. long when in fruit, and not much above 1 in. diameter. Outer bracts glutinous and deciduous. Cone-scales with a broad tomentose-villous base and short glabrous persistent or deciduous ends. Perianth not seen very perfect, the segments falling off separately, densely villous outside with short hairs, not viscid or at least not so much so as in *P. Drummondii*. Nut broad, truncate, the margins comose, both faces glabrous or slightly pubescent.—Meissn. in Pl. Preiss. i. 496, ii. 245 and in DC. Prod. xiv. 271.

W. Australia. King George's Sound, *Baxter, Preiss, n.* 647, *Drummond, 3rd coll. n.* 248.

32. **P. rigida,** *R. Br. in Trans. Linn. Soc.* x. 69, *Prod.* 364. A rigid divaricate shrub of 2 or 3 ft., quite glabrous except the cones. Leaves very rigid, trichotomously bipinnate, the ultimate segments in the typical form very short but in other specimens $\frac{1}{2}$ to 1 in. long, all terete divaricate and pungent-pointed. Cones terminal or in the forks of the branches, sessile, nearly globular, about $\frac{1}{2}$ in. diameter without the flowers, or rather larger when in fruit. Outer bracts lanceolate, acuminate, glabrous outside, silky inside, deciduous. Cone-scales broad, scarcely acuminate, silky-villous outside at the base, otherwise glabrous. Perianth nearly $\frac{3}{4}$ in. long, very villous almost plumose, the

segments falling off separately. Style-end continuous, fusiform, with few short hairs, glabrous and 4-angled at the base. Nut not seen ripe, the young ones densely comose.—Meissn. in Pl. Preiss. i. 497, and in DC. Prod. xiv. 271.

W. Australia. King George's Sound and adjoining districts, *R. Brown, A. Cunningham, Drummond,* 1st *coll., Preiss, n.* 645, 648, 649, and others.

33. **P. multisecta,** *F. Muell. Fragm.* vi. 242. A densely branched bushy shrub, glabrous except the cones and somewhat glaucous, closely allied to and perhaps a variety of *P. rigida.* Leaves trichotomously divided or pinnate with dichotomous pinnæ, the segments terete, rigid, pungent-pointed, not so short as in some varieties of *P. rigida*, but quite like those of other forms of that species. Cones ovoid or oblong, ¾ to 1 in. long and about ½ in. diameter without the perianths, sessile in the forks of the branches. Outer bracts not numerous, lanceolate, acuminate, glabrous. Cone-scales broad, silky-tomentose outside, with prominent persistent acuminate and glabrous ends. Perianth silky-villous, about ½ in. long, the segments falling off separately. Style-end continuous, fusiform, shortly pubescent. Nut broad, densely comose on the margins, more sparingly hirsute on both faces.

S. Australia. Kangaroo Island, *Waterhouse.*

34. **P. conifera,** *Meissn. in Hook. Kew Journ.* vii. 67, *and in DC. Prod.* xiv. 271. A much-branched bushy shrub of 1 to 3 or 4 ft. the younger branches tomentose-pubescent, almost woolly, the older ones and foliage glabrous. Leaves trifid or the middle segment again divided, the segments divaricate, terete, rigid, pungent-pointed, ½ to ¾ in. long. Cones mostly in the forks of the branches, sessile, oblong-cylindrical, attaining about 1 in. in length and 4 to 6 lines diameter without the perianths. Outer bracts very deciduous. Cone-scales softly tomentose, at first acuminate, but the points deciduous and in the old cones the scales very broad, about 3 lines diameter, hard, tomentose, few for the length of the cone although closely imbricate. Perianth hirsute, 6 to 7 lines long, the segments falling off separately. Style-end continuous, narrow-fusiform, hirsute with few short hairs. Nut ovate, almost acuminate, comose all over, but more densely so on the margins and back than on the inner face.

W. Australia. Murchison river, *Oldfield, Drummond, 6th coll. n.* 167. The species is very nearly allied to *P. rigida*, but with tomentose branches and longer cones.

SECT. 6. HEBEGYNE.—Habit and characters of *Petrophile* except that the style has not a distinct fusiform end.

35. **P. semifurcata,** *F. Muell. Herb.* A bushy shrub with the habit and tomentose branches of *P. conifera.* Leaves glabrous, rigid, terete, 3 to 5 in. long, entire or divided at the end into 2 or 3 short segments, obtuse or shortly pointed but not pungent. Cones terminal or in the forks of the branches, shortly pedunculate, oblong-cylindrical, ¾ to

1½ in. long, and about ½ in. diameter. Outer bracts very deciduous. Cone-scales broad, rigid, tomentose, rounded or obtuse with very small points, not numerous but closely imbricate as in *P. conifera*. Perianth silky-villous, nearly ¾ in. long, the segments falling off separately, not seen however very perfect. Style pubescent from the base, tomentose-villous and slightly thickened upwards but not distinctly fusiform at the end.

W. Australia. Murchison river, *Oldfield.*

2. ISOPOGON, R. Br.

Flowers hermaphrodite. Perianth regular, the tube slender, the upper portion falling off entire with the 4 linear or oblong segments of the limb, leaving a persistent base which finally splits or is cast off as the fruit ripens. Anthers all perfect and free, sessile within the segments of the limb, the connective tipped with a small appendage. No hypogynous scales. Ovary sessile, with a single orthotropous or slightly amphitropous ovule, pendulous from near the apex of the cavity. Style filiform, usually more or less dilated or clavate towards the end, and separated from the narrow often bulbous-based brush by a short neck or constriction, the clavate portion usually papillose-pubescent, rarely the style-end continuous and slender, the stigma terminal. Fruit a small dry and indehiscent nut, usually ovoid-conical, scarcely compressed and not winged, hirsute all over, the lower hairs or nearly all forming a long coma.—Shrubs with the habit of *Petrophila*. Leaves rigid, entire or divided, terete or flat and sometimes broad. Flowers yellow, pink or lilac, in dense spikes or *cones*, each flower sessile within a bract or *scale*, the cones hemispherical globular or ovoid, terminal or rarely axillary, the receptacle or rhachis woolly, flat convex conical or cylindrical, the scales tomentose or villous outside, glabrous inside, imbricate, deciduous after flowering or if long persistent and retaining the seed, readily detached and always falling off with the seed, or in a few species leaving a very short persistent base. At the base of the cone are also, as in *Petrophila*, several imbricate empty bracts, forming an involucre, larger or smaller than the cone-scales and usually more persistent, the cones are also almost always closely surrounded by floral leaves. Nuts shorter than the cone-scales, and very little varied in the whole genus.

The genus is limited to extratropical Australia, and is chiefly Western. Although the majority of the species differ from *Petrophila* in the mode of breaking up the perianth, in the form of the style end, and in the shape and indumentum of the nut, all these characters have exceptions, and perhaps the most constant one is that of the cone-scales, which in *Petrophila* remain firmly attached to the receptacle, opening spontaneously or by force for the emission of the nuts, whilst in *Isopogon* they separate from the receptacle either with the nuts or previously.

SECT. 1. **Hypsanthus.**—*Cone-scales acuminate, not very closely imbricate, the inner ones narrow. Receptacle flat, convex or rarely oblong. Leaves flat, except in* I. adenanthoides.

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